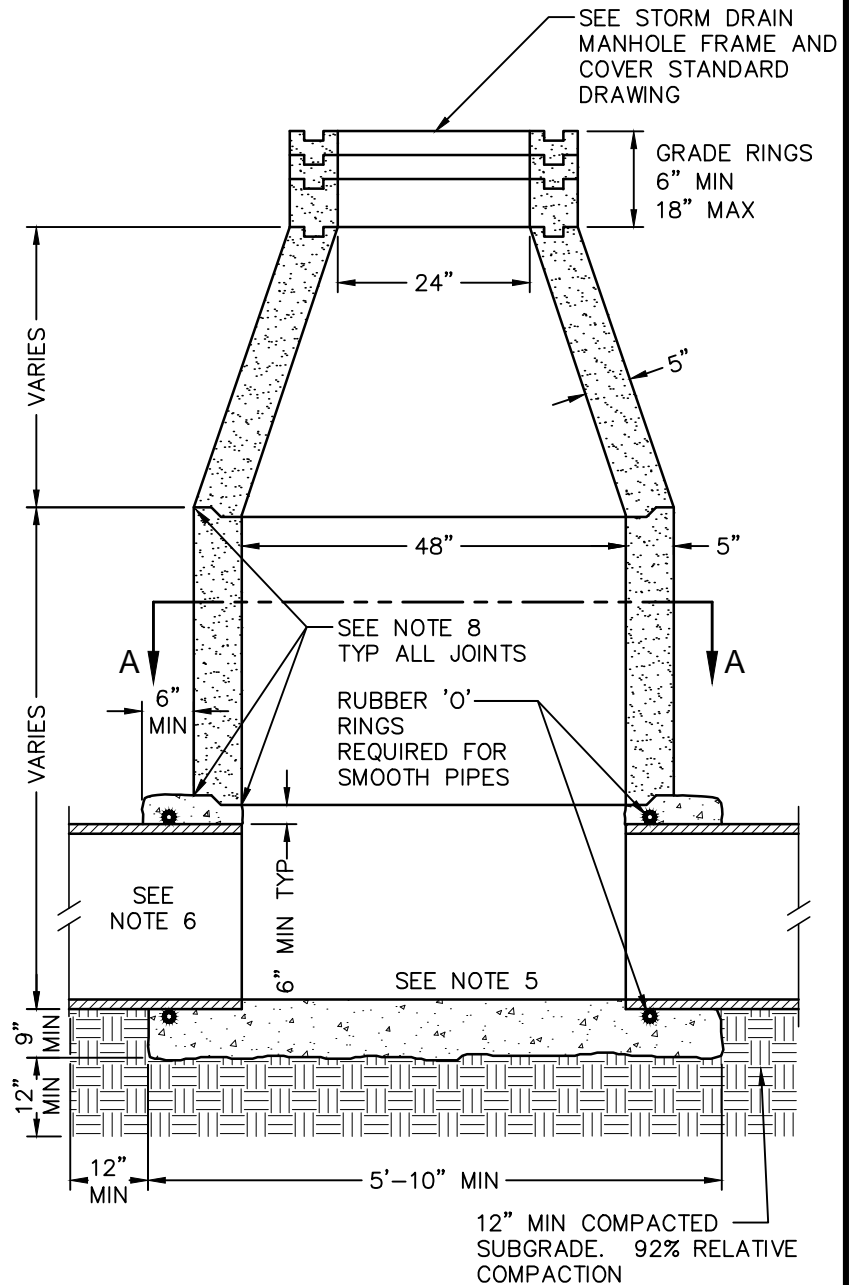


PIPE ENDS SHALL BE CUT AND MORTARED FLUSH WITH INSIDE WALL OF MANHOLE

SECTION A-A

NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE-HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. SUMP BOTTOM MANHOLES ARE REQUIRED ON ALL STORM DRAIN SYSTEMS WITH PUMPS. 18" SUMP BELOW PIPE INVERT WHERE REQUIRED. SEE STORM DRAIN MANHOLE SUMP REQUIREMENTS STANDARD DRAWING.
6. 48" MANHOLES ARE REQUIRED FOR STORM DRAIN PIPE SIZES FROM 12" TO 24" OR AS REQUIRED BY THE CITY ENGINEER.
7. EXFILTRATION TEST REQUIRED AS PER ASTM C969-02, AS IMPLEMENTED BY CITY OF VISALIA.
8. SEE STORM DRAIN MANHOLE JOINT FINISHING REQUIREMENTS STANDARD DRAWING.



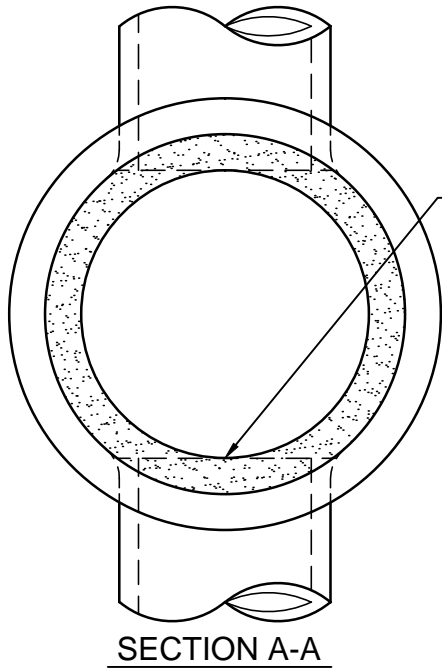
APPROVED BY:  09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

**CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS**

48" STORM DRAIN MANHOLE

REVISIONS
 06/14/13
 BK 2016

D-1

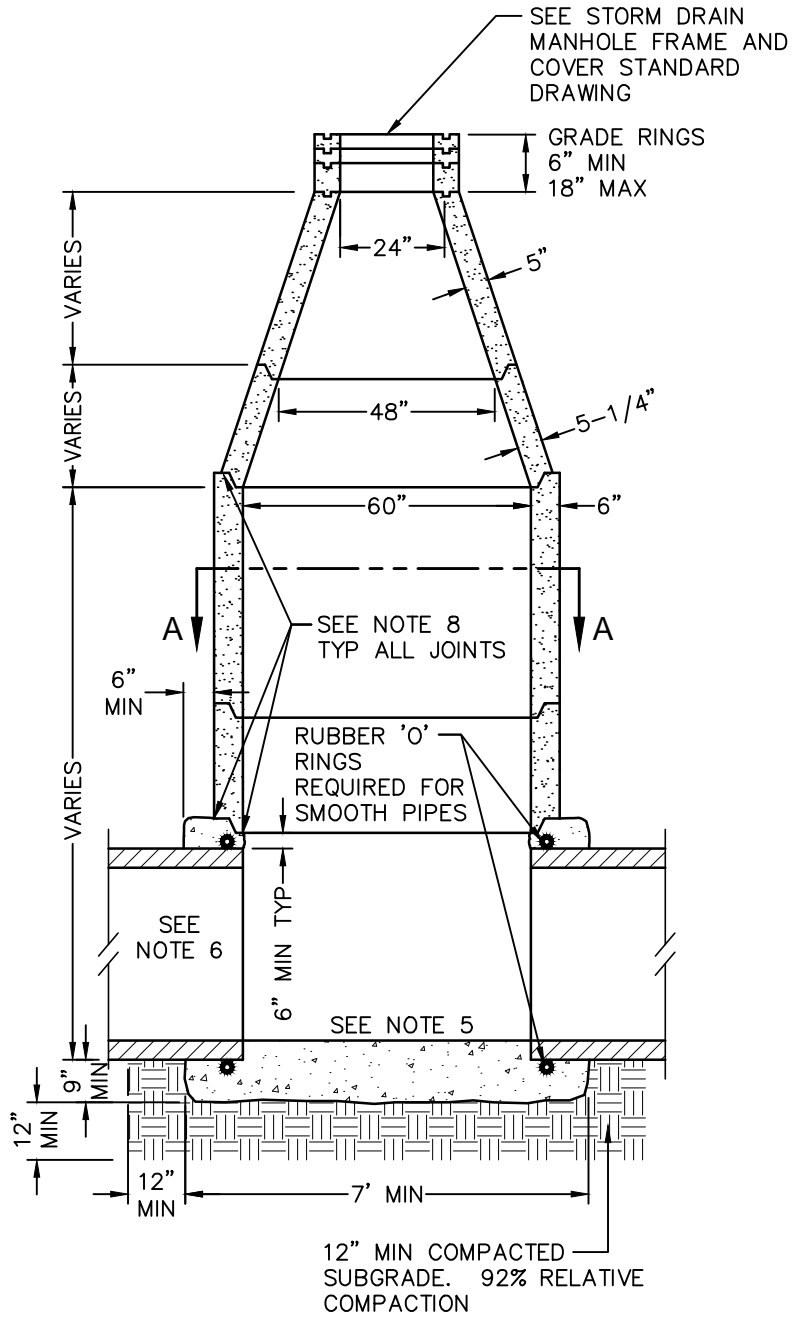


PIPE ENDS SHALL BE CUT AND MORTARED FLUSH WITH INSIDE WALL OF MANHOLE

SECTION A-A

NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE-HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. SUMP BOTTOM MANHOLES ARE REQUIRED ON ALL STORM DRAIN SYSTEMS WITH PUMPS. 18" SUMP BELOW PIPE INVERT WHERE REQUIRED. SEE STORM DRAIN MANHOLE SUMP REQUIREMENTS STANDARD DRAWING.
6. 60" MANHOLES ARE REQUIRED FOR STORM DRAIN PIPE SIZES FROM 27" TO 36" OR AS REQUIRED BY THE CITY ENGINEER.
7. EXFILTRATION TEST REQUIRED AS PER ASTM C969-02, AS IMPLEMENTED BY CITY OF VISALIA.
8. SEE STORM DRAIN MANHOLE JOINT FINISHING REQUIREMENTS STANDARD DRAWING.



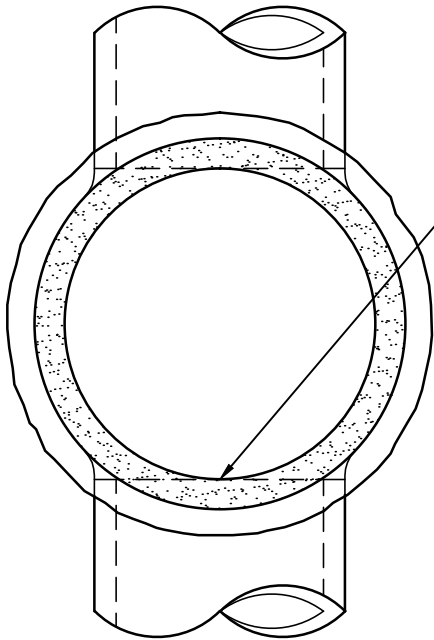
APPROVED BY:  09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

60" STORM DRAIN MANHOLE

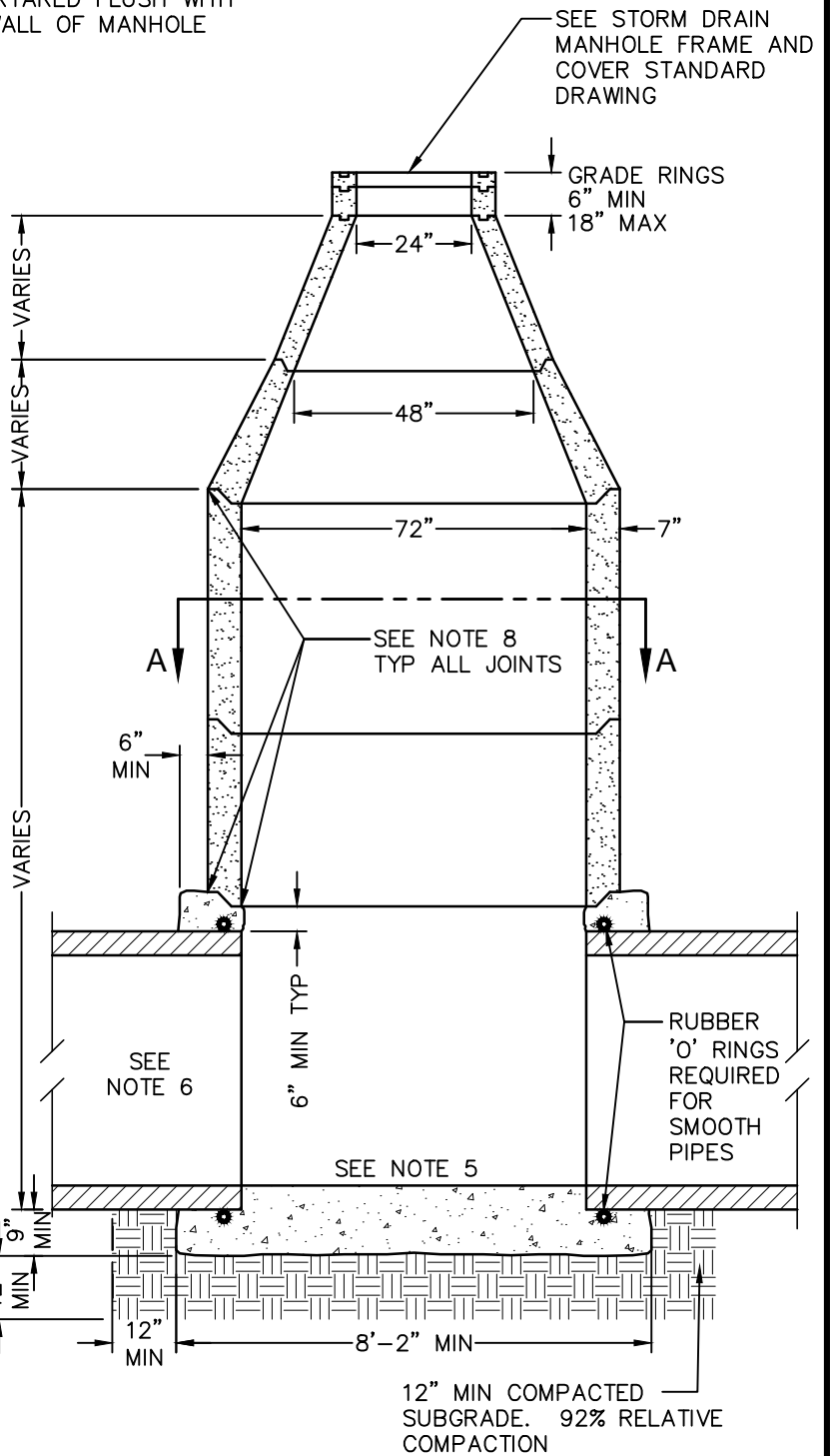
REVISIONS
 06/14/13
 BK 2016

D-2



PIPE ENDS SHALL BE CUT AND MORTARED FLUSH WITH INSIDE WALL OF MANHOLE

SECTION A-A



NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE-HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. SUMP BOTTOM MANHOLES ARE REQUIRED ON ALL STORM DRAIN SYSTEMS WITH PUMPS. 18" SUMP BELOW PIPE INVERT WHERE REQUIRED. SEE STORM DRAIN MANHOLE SUMP REQUIREMENTS STANDARD DRAWING.
6. 72" MANHOLES ARE REQUIRED FOR STORM DRAIN PIPE SIZES FROM 39" AND LARGER OR AS REQUIRED BY THE CITY ENGINEER.
7. EXFILTRATION TEST REQUIRED AS PER ASTM C969-02, AS IMPLEMENTED BY CITY OF VISALIA.
8. SEE STORM DRAIN MANHOLE JOINT FINISHING REQUIREMENTS STANDARD DRAWING .

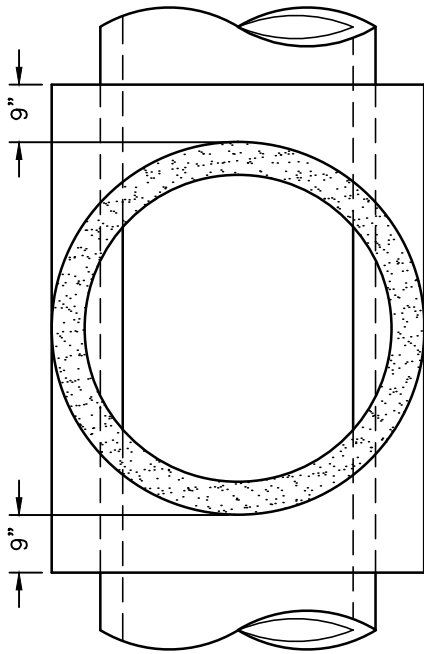
APPROVED BY:  09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

**CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS**

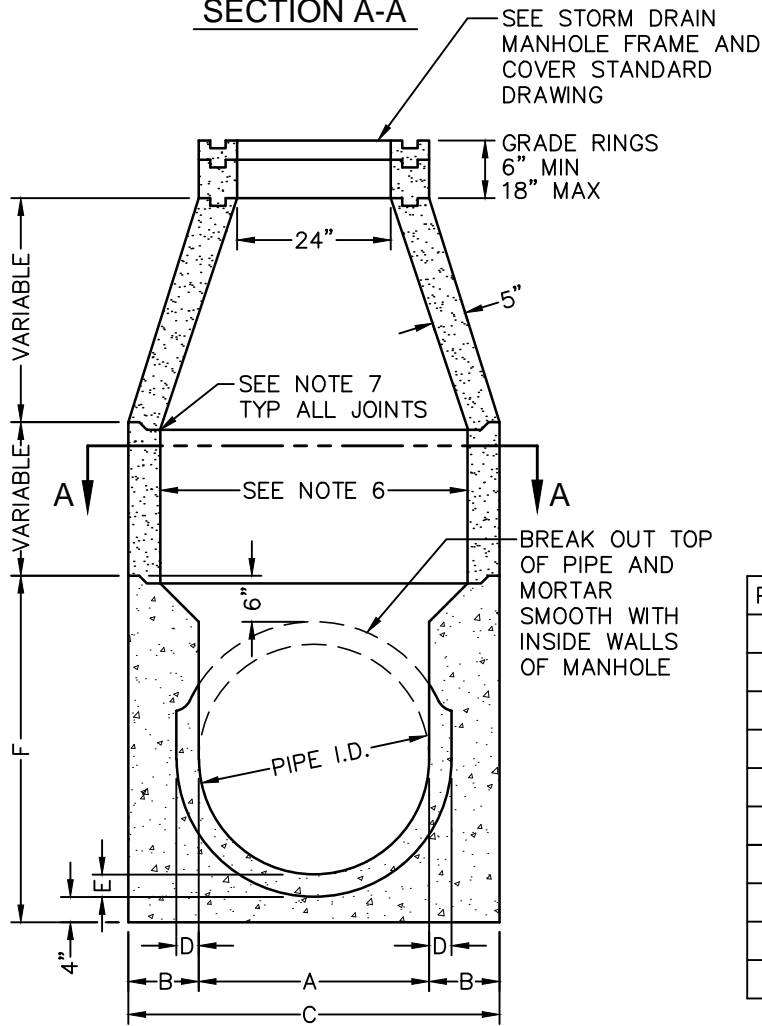
72" STORM DRAIN MANHOLE

REVISIONS
 06/14/13
 BK 2016

D-3



SECTION A-A



NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE-HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. EXFILTRATION TEST REQUIRED AS PER ASTM C969-02, AS IMPLEMENTED BY CITY OF VISALIA.
6. MANHOLE SHALL BE SIZED TO MATCH MANHOLE BASE. 48" MINIMUM INNER DIAMETER MANHOLE IS REQUIRED.
7. SEE STORM DRAIN MANHOLE JOINT FINISHING REQUIREMENTS STANDARD DRAWING.

PIPE I.D.	A	B	C	MIN D	E	F
24"	24"	17"	58"	3"	3"	40"
27"	27"	15-1/2"	58"	3"	3"	43"
30"	30"	14"	58"	3"	3"	46"
36"	36"	17"	70"	3-1/2"	3-1/2"	53"
42"	42"	15"	72"	4"	4"	60"
48"	48"	12"	72"	5"	5"	68"
54"	54"	10-1/2"	75"	5-1/2"	5-1/2"	75"
60"	60"	11"	82"	6"	6"	82"
66"	66"	11-1/2"	89"	6-1/2"	6-1/2"	89"
72"	72"	12"	96"	7"	7"	96"

APPROVED BY: *[Signature]* 09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

**CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS**

**CAST IN PLACE CONCRETE PIPE
 MANHOLE**

REVISIONS
 06/14/13
 BK 2016

D-4

RESERVED FOR FUTURE DETAIL

APPROVED BY: _____

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

RESERVED

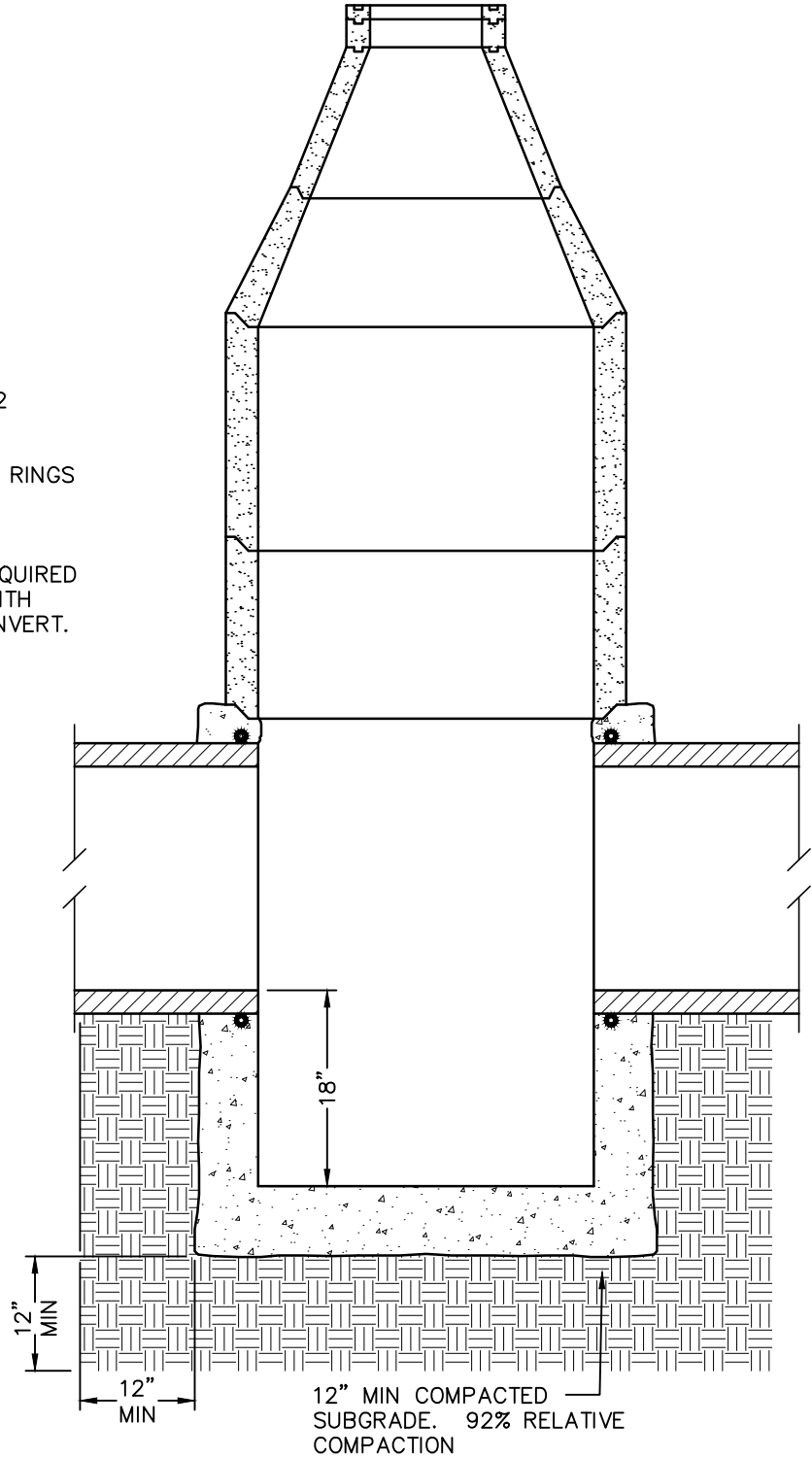
REVISIONS

BK 2016

D-5

NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. SUMP BOTTOM MANHOLES ARE REQUIRED ON ALL STORM DRAIN SYSTEMS WITH PUMPS. 18" SUMP BELOW PIPE INVERT.



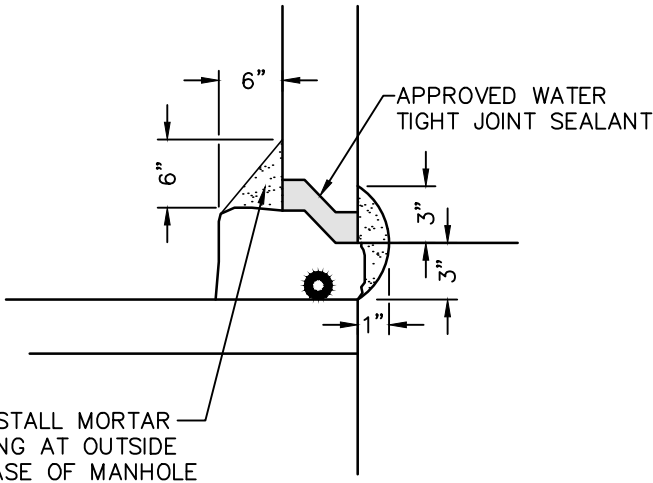
APPROVED BY: *[Signature]* 09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

STORM DRAIN MANHOLE
 SUMP REQUIREMENTS

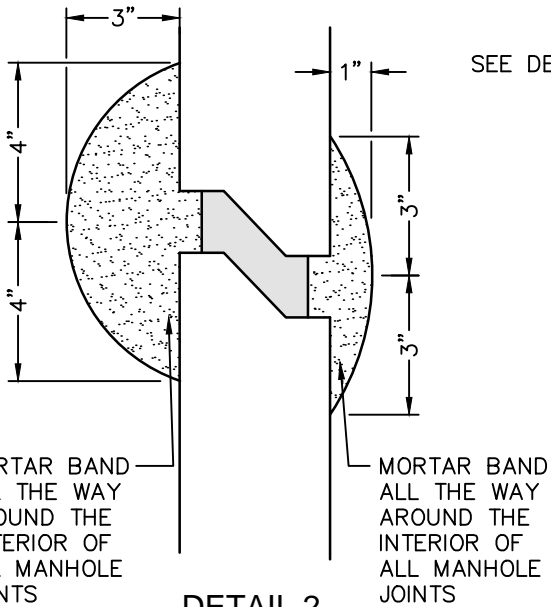
REVISIONS
 06/14/13
 BK 2016

D-6



DETAIL 1

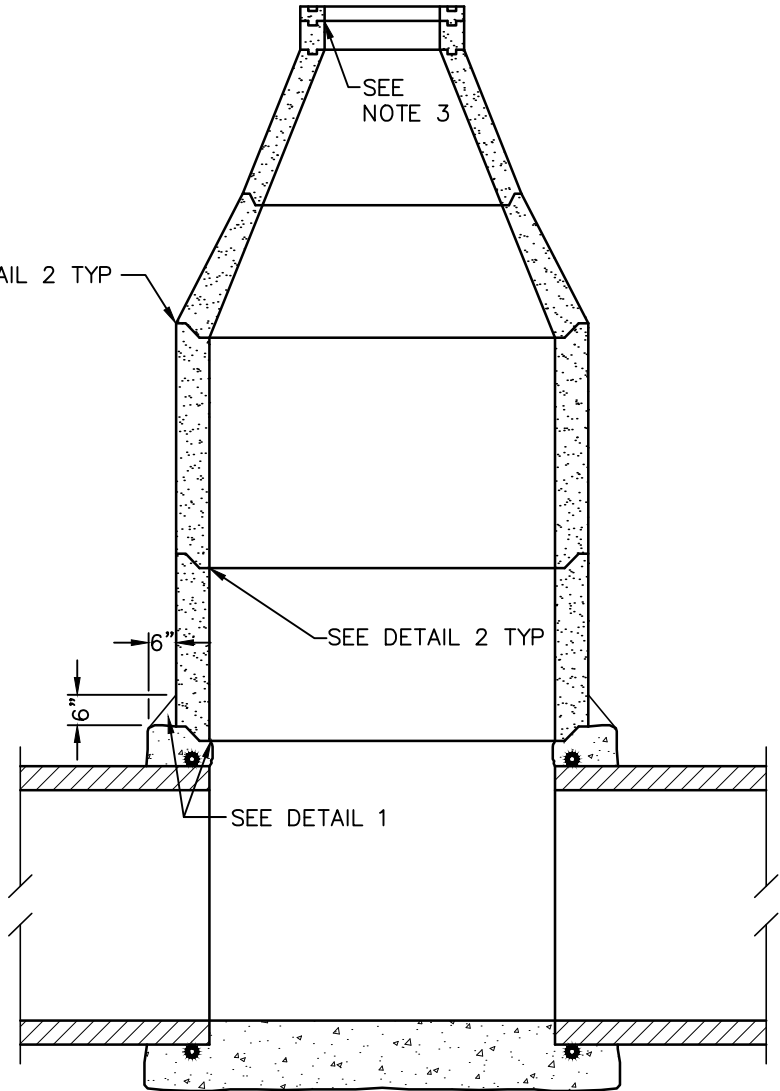
INSTALL MORTAR RING AT OUTSIDE BASE OF MANHOLE



DETAIL 2

MORTAR BAND ALL THE WAY AROUND THE EXTERIOR OF ALL MANHOLE JOINTS

MORTAR BAND ALL THE WAY AROUND THE INTERIOR OF ALL MANHOLE JOINTS



NOTES:

1. ALL JOINTS SHALL BE FINISHED WITH MORTAR AS SHOWN AND/OR NOTED ON THIS DETAIL.
2. MORTAR MIXTURE SHALL BE ONE PART CEMENT PER TWO PARTS SAND.
3. MORTAR INSIDE OF GRADE RINGS TO A SMOOTH SURFACE.
4. ALL JOINTS SHALL BE WATER TIGHT.

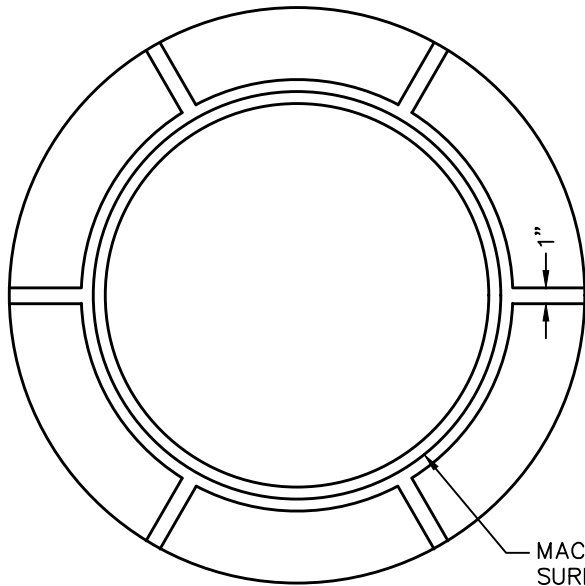
APPROVED BY: *[Signature]* 09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

**STORM DRAIN MANHOLE
 JOINT FINISHING REQUIREMENTS**

REVISIONS
 06/14/13
 BK 2016

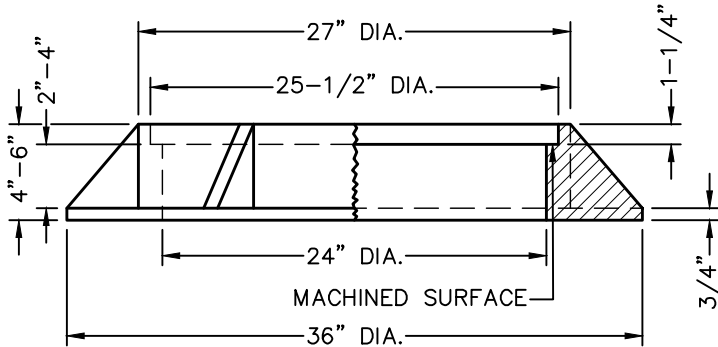
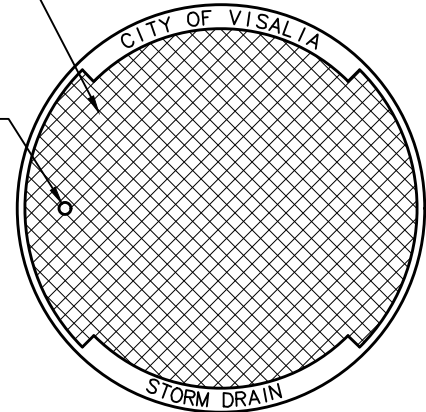
D-7



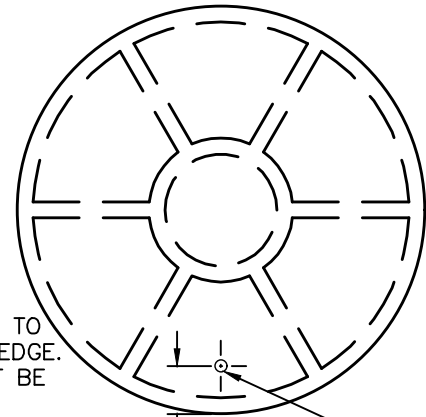
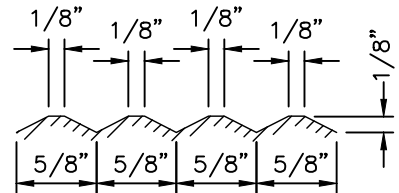
MACHINED SURFACE

CHECKERED TOP DESIGN

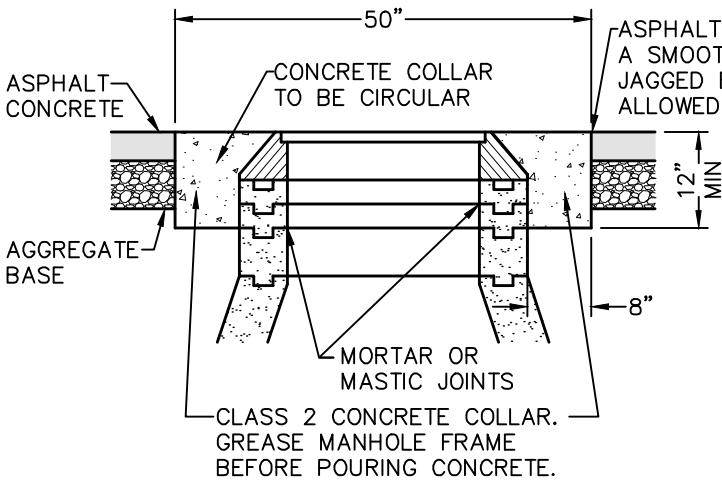
3/4" PICK HOLE



MANHOLE FRAME

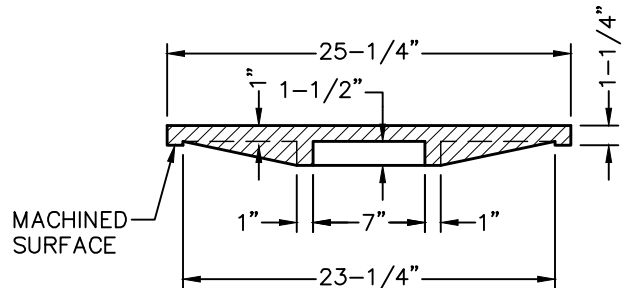


3/4" PICK HOLE



ASPHALT SHALL BE CUT TO A SMOOTH CONSISTENT EDGE. JAGGED EDGES WILL NOT BE ALLOWED.

MANHOLE ADJUSTMENT



MACHINED SURFACE

MANHOLE COVER

NOTE: FRAME, COVER AND CONCRETE COLLAR SHALL MATCH CROSS SLOPE. CURE CONCRETE A MINIMUM OF 48 HOURS PRIOR TO TRAFFIC USE.

APPROVED BY: *Chris Case* 02/05/25
 CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

**STORM DRAIN
 MANHOLE FRAME AND COVER**

REVISIONS
 02/05/25
 BK 2016

D-8

RESERVED FOR FUTURE DETAIL

APPROVED BY: _____

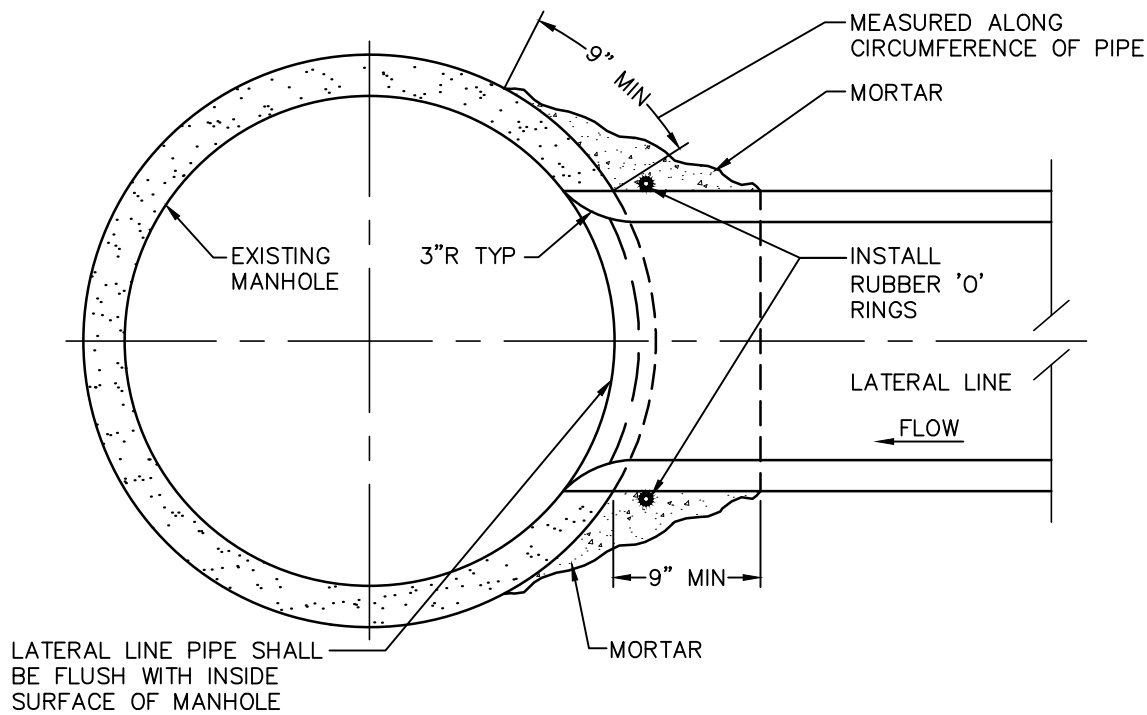
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

RESERVED

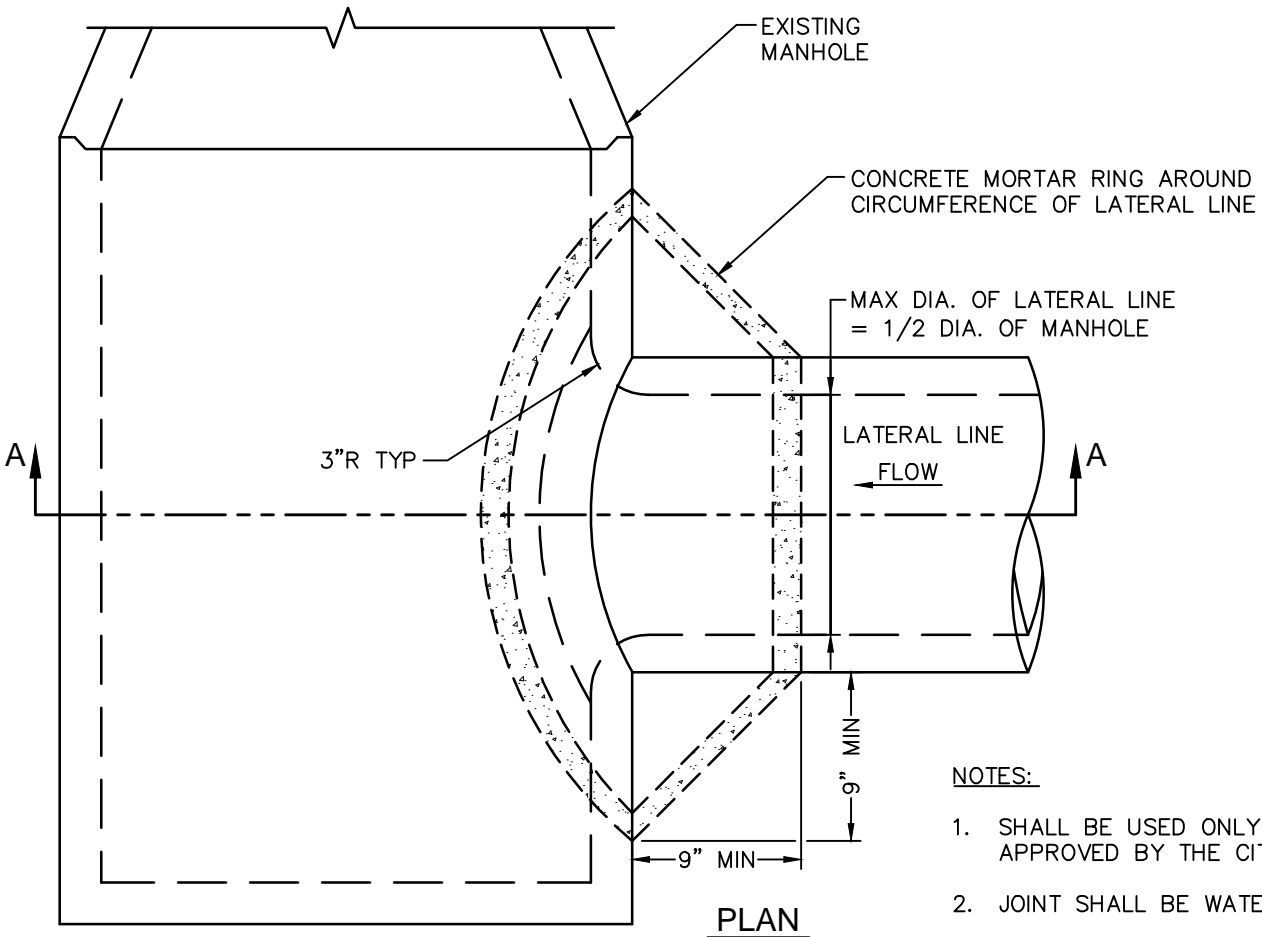
REVISIONS

BK 2016

D-9



SECTION A-A



NOTES:

1. SHALL BE USED ONLY AS APPROVED BY THE CITY ENGINEER.
2. JOINT SHALL BE WATER TIGHT.

APPROVED BY: *[Signature]* 09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

**CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS**

**LATERAL LINE CONNECTION
 AT EXISTING MANHOLE**

REVISIONS
 06/14/13
 BK 2016

D-10

RESERVED FOR FUTURE DETAIL

APPROVED BY: _____

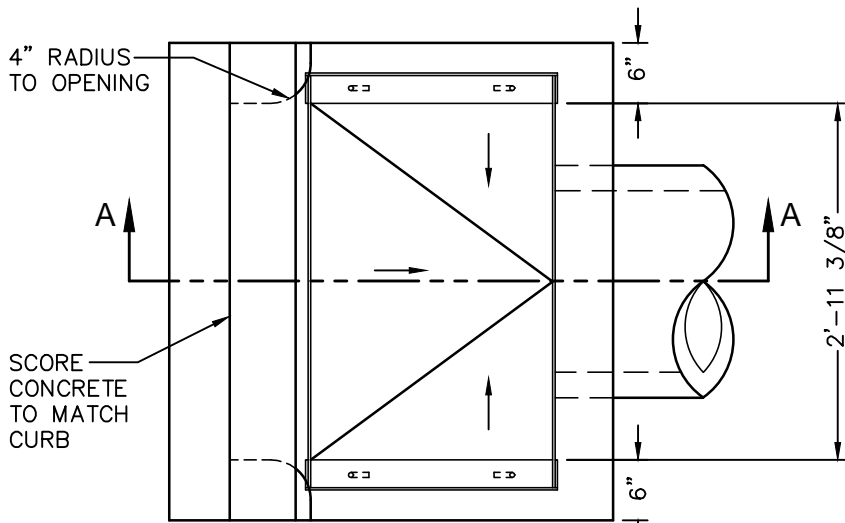
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

RESERVED

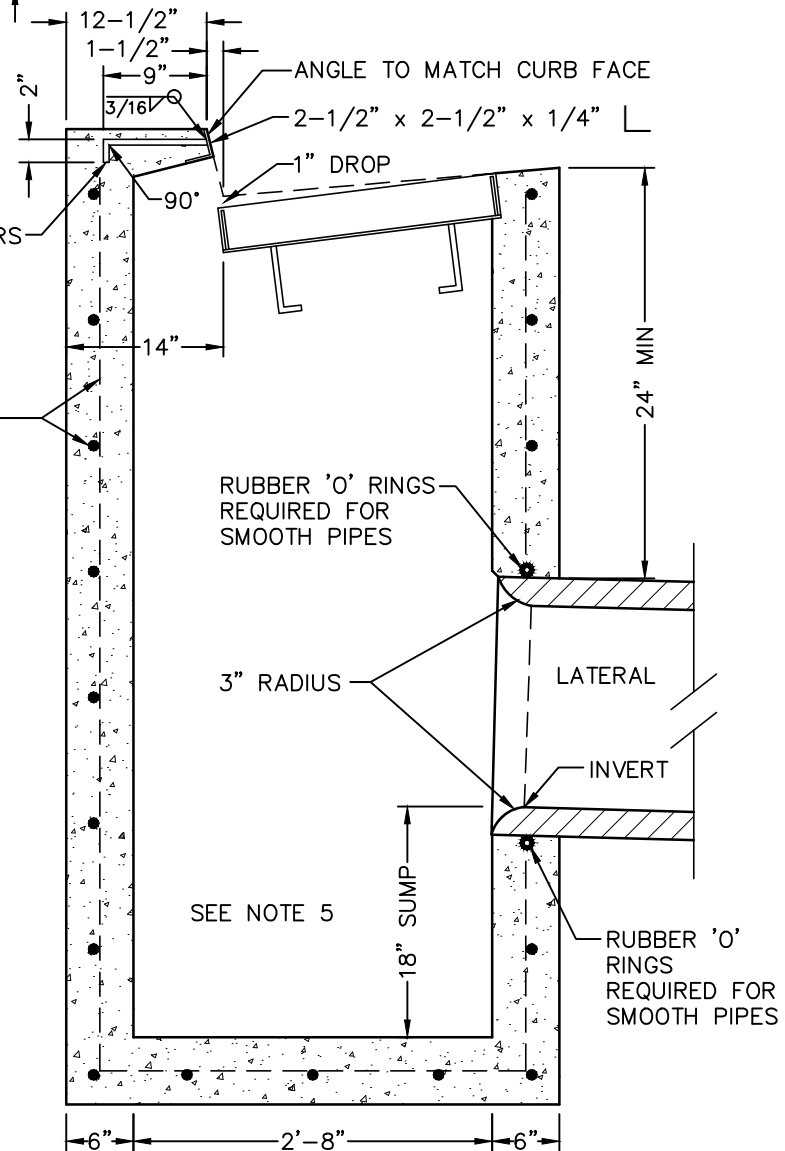
REVISIONS

BK 2016

D-11



PLAN



SECTION A-A

NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MAJOR TYPE DRAINAGE INLETS SHALL BE INSTALLED ON ALL PUBLIC STREETS.
3. 12" MINIMUM STORM DRAIN LATERAL ON LOCAL STREETS.
4. 18" MINIMUM STORM DRAIN LATERAL ON COLLECTOR AND ARTERIAL STREETS.
5. SUMP BOTTOM DRAIN INLETS ARE REQUIRED ON ALL STORM DRAIN SYSTEMS.
6. #4 REBAR AT 18" O.C. BOTH WAYS WHEN DRAIN INLET IS DEEPER THAN 6' BELOW TOP OF CURB.
7. MINIMUM CLEAR SPACING BETWEEN SURFACES OF CONCRETE AND REINFORCING STEEL SHALL BE 2".

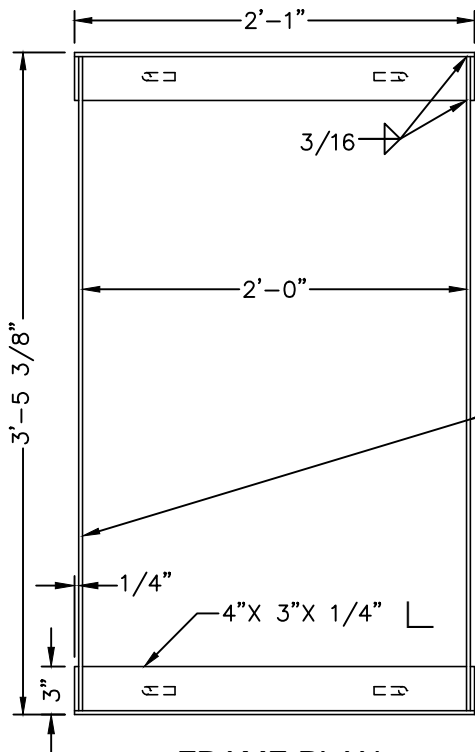
APPROVED BY:  09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

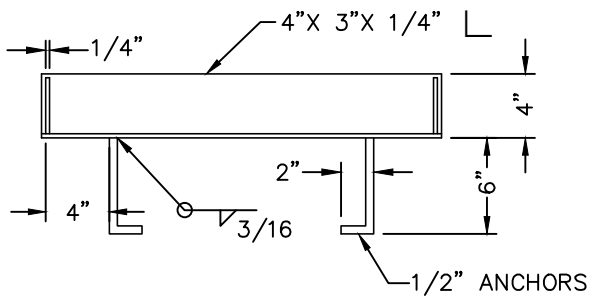
DRAINAGE INLET - GO TYPE

REVISIONS
 06/14/13
 BK 2016

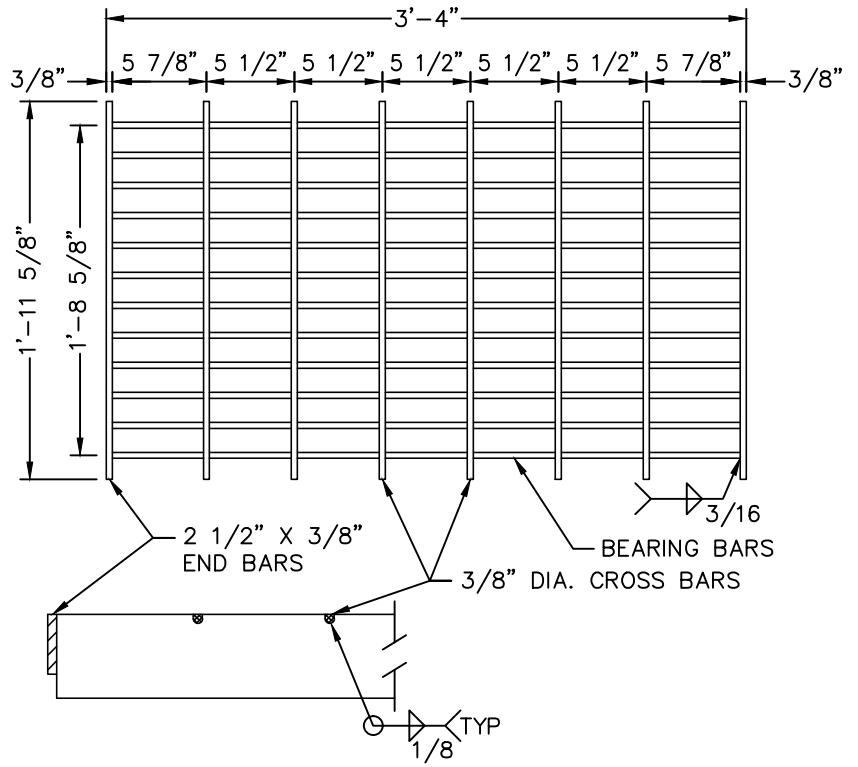
D-12



FRAME PLAN



FRAME SECTION



GRATE DETAIL

3 1/2" X 1/4" X 3'-4 7/8" BAR

NOTES:

1. BEARING BARS SHALL BE 3-1/2" X 3/8" BARS ON 1-7/8" CENTERS.
2. 3/8" DIAMETER CROSS BARS MAY BE FILLET WELDED, RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS.
3. FRAME AND GRATE SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.

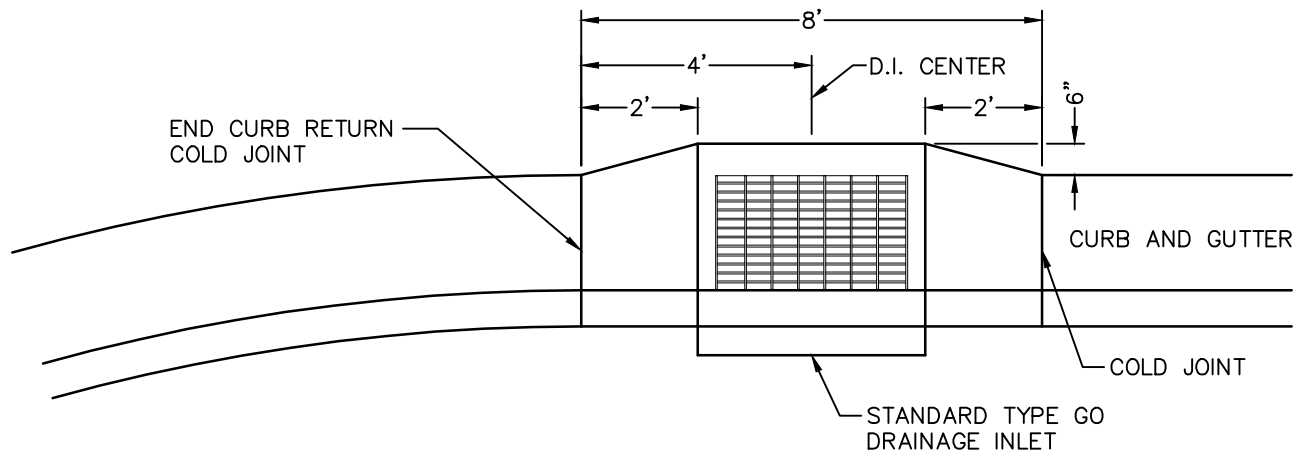
APPROVED BY: *[Signature]* 09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

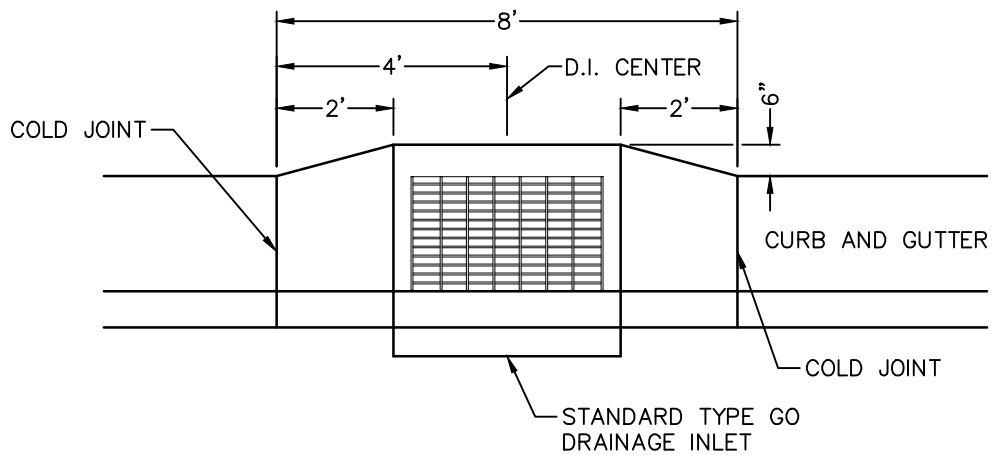
DRAINAGE INLET – GO TYPE
 FRAME AND GRATE DETAIL

REVISIONS
 06/17/04
 BK 2016

D-13



TYPE GO DRAINAGE INLET (D.I.)
INSTALLED AT CURB RETURN



TYPE GO DRAINAGE INLET (D.I.)
INSTALLED MID-BLOCK

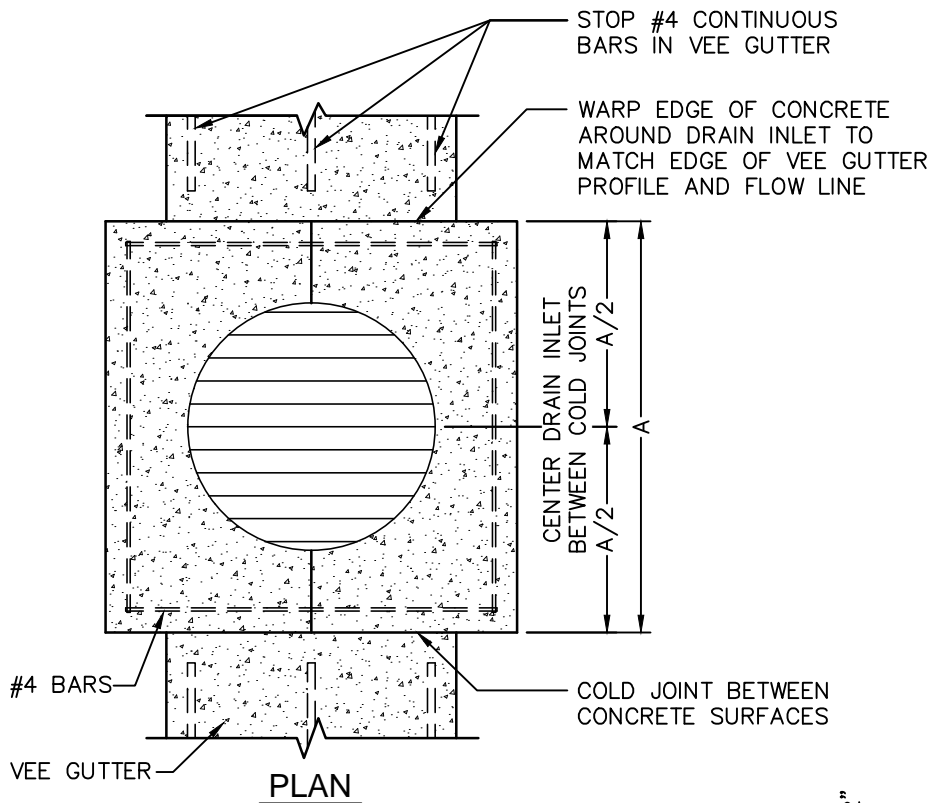
APPROVED BY: *[Signature]* 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

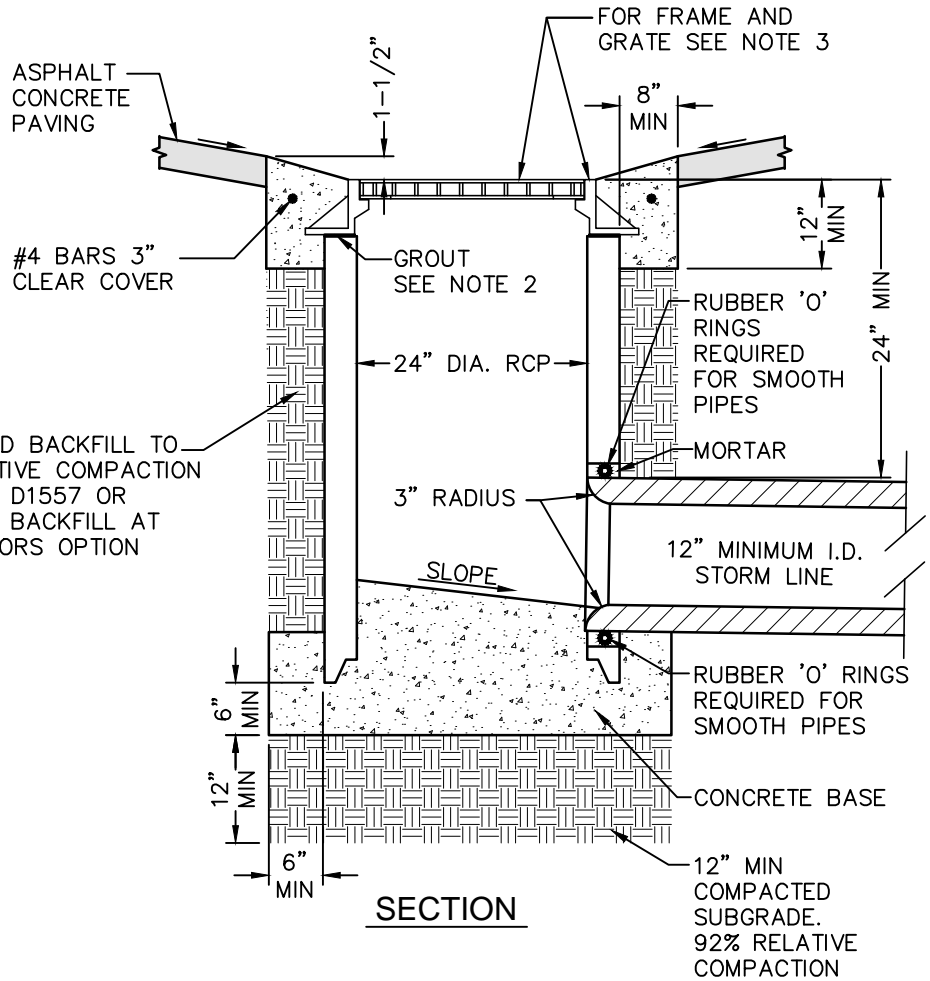
MISCELLANEOUS DRAINAGE INLET
DETAILS

REVISIONS
08/26/16
BK 2016

D-14




PLAN



SECTION

NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. GROUT SHALL BE A HIGH STRENGTH, SHRINKAGE COMPENSATING, NON-METALLIC GROUT, OR EQUAL.
3. SEE VEE GUTTER DRAINAGE INLET FRAME AND GRATE STANDARD DRAWING.

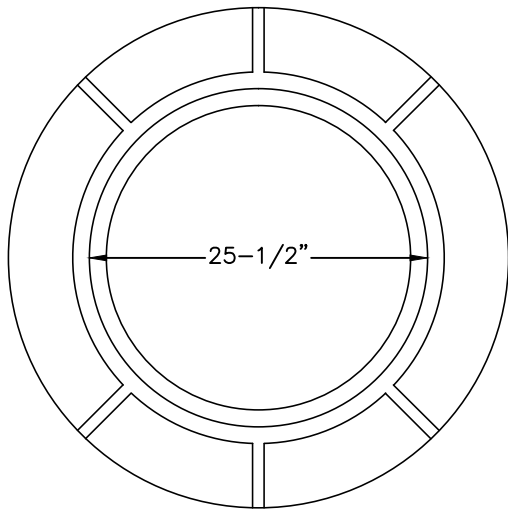
APPROVED BY:  09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

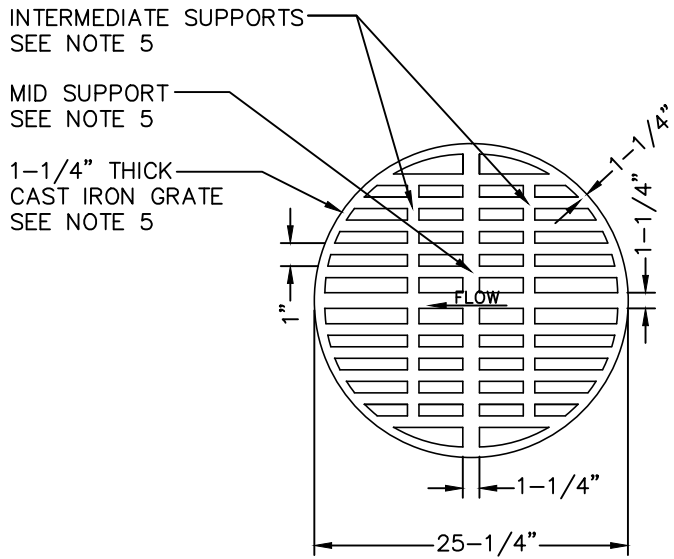
VEE GUTTER DRAINAGE INLET

REVISIONS
06/14/13
BK 2016

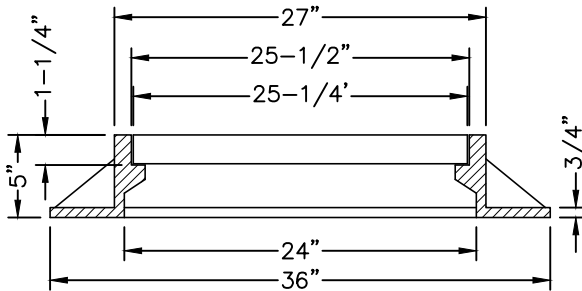
D-15



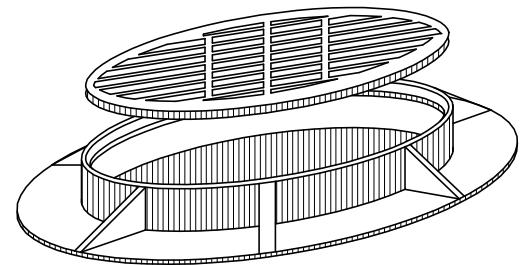
**FRAME
PLAN**



**GRATE
PLAN**



**FRAME
SECTION**



PERSPECTIVE

NOTES:

1. ALL DIMENSIONS ARE FINISHED DIMENSIONS. FRAME AND COVER BEARING SURFACE TO BE MACHINED TO ASSURE CLOSE, QUIET FIT.
2. CONSTRUCTION MATERIAL SHALL BE CAST IRON, DIPPED IN BLACK BITUMINOUS PAINT.
3. FRAME AND GRATE TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM DESIGNATION 48, CLASS 35B, AND EXCEED H2O WHEEL LOADING.
4. GRATE TO BE INSTALLED SUCH THAT THE SLOTS ARE PARALLEL WITH THE DIRECTION OF WATER FLOW.
5. GRATES WITH MID AND INTERMEDIATE SUPPORTS SHALL BE USED AT ALL LOCATIONS WHERE BICYCLE OR OTHER WHEELED TRANSPORT SUCH AS WHEEL CHAIRS CAN BE ANTICIPATED. COVERS WITHOUT INTERMEDIATE SUPPORTS SHALL NOT BE USED WITHOUT APPROVAL OF THE CITY ENGINEER.
6. ALL GRATES SHALL HAVE A MINIMUM OPEN AREA OF 1.0 SQUARE FEET AND A MINIMUM WEIR PERIMETER OF 6.0 LINEAR FEET. ENGINEER OF RECORD SHALL BE RESPONSIBLE FOR VERIFYING GRATES MEET DRAINAGE REQUIREMENTS.
7. IF GRATE IS LOCATED IN A DESIGNATED ACCESSIBLE PATH OF TRAVEL, GRATE SHALL BE A.D.A. COMPLIANT.

APPROVED BY: 
 CITY ENGINEER R.P.E. 81734 09/16/16
 DATE

**CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS**

VEE GUTTER INLET FRAME & GRATE

REVISIONS
 06/14/13
 BK 2016

D-16

RESERVED FOR FUTURE DETAIL

APPROVED BY: _____

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

RESERVED

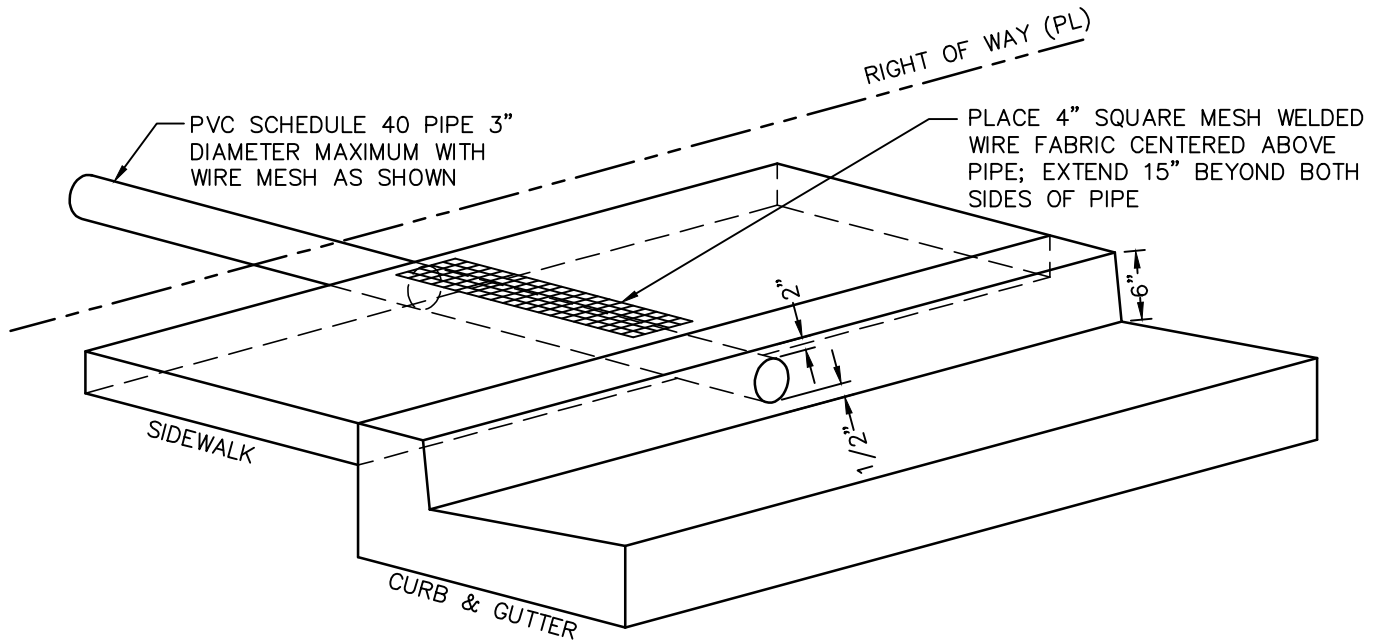
REVISIONS

BK 2016

D-17

RESERVED FOR FUTURE DETAIL


APPROVED BY: _____	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS	
RESERVED	REVISIONS BK 2016	D-18



PERSPECTIVE

NOTES:

1. WHERE SIDEWALK AND CURB AND GUTTER EXIST, SIDEWALK AND CURB AND GUTTER SHALL BE REMOVED AND REPLACED TO THE NEAREST JOINT AND SHALL BE CONSTRUCTED PER APPLICABLE CITY OF VISALIA STANDARD DRAWINGS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AN ENCROACHMENT PERMIT FOR ANY WORK WITHIN THE CITY RIGHT OF WAY, INCLUDING THE REMOVAL AND REPLACEMENT OF THE SIDEWALK AND CURB AND GUTTER AND THE CONSTRUCTION OF THE RESIDENTIAL UNDER SIDEWALK DRAIN, FROM THE CITY OF VISALIA ENGINEERING DIVISION.
3. THE ENGINEER OF RECORD SHALL DETERMINE THE NUMBER OF DRAINS REQUIRED.
4. WELDED WIRE MESH SHALL BE 4X4-W2.1XW2.1.

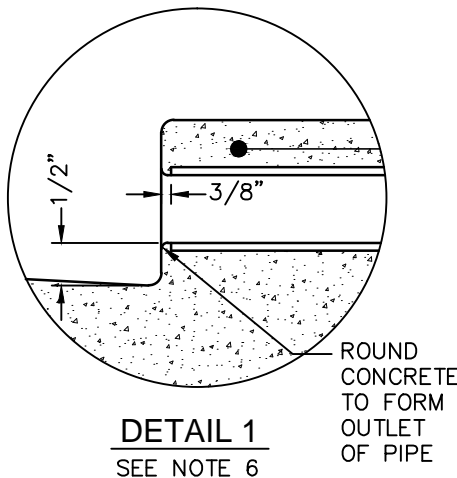
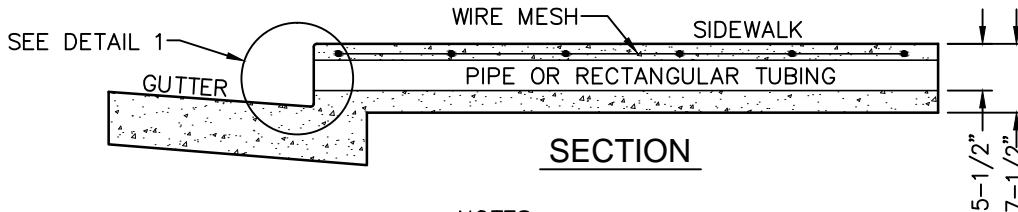
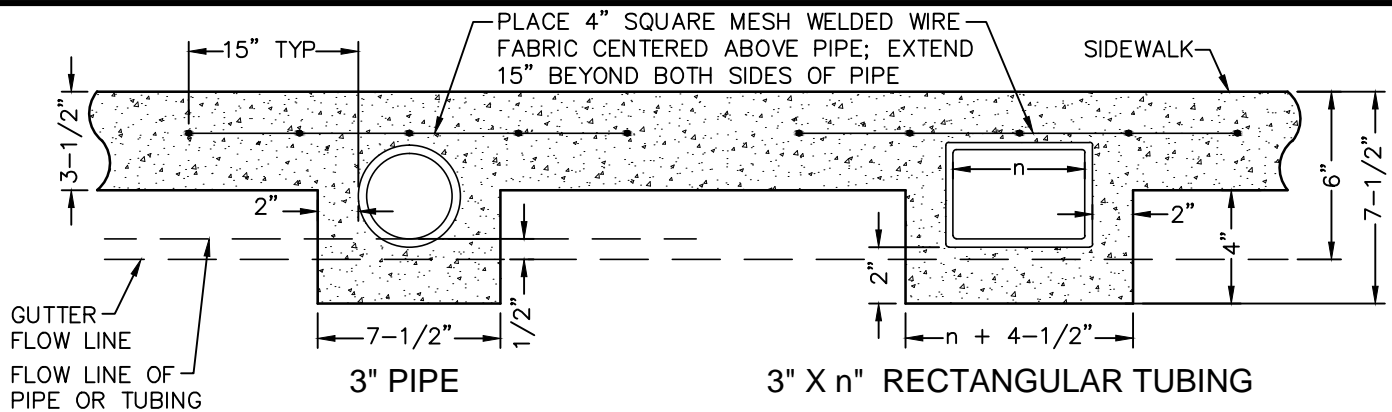
APPROVED BY:  09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

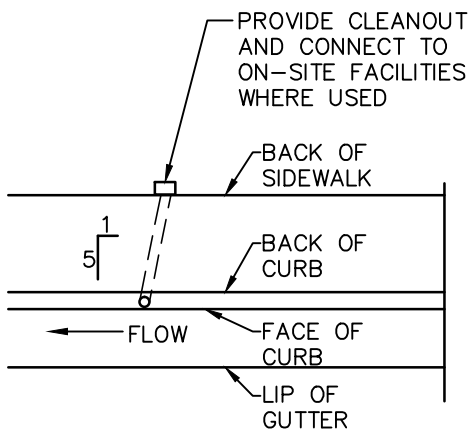
RESIDENTIAL SIDEWALK DRAIN

REVISIONS
 06/14/13
 BK 2016

D-19



DETAIL 1
SEE NOTE 6



DETAIL 2
SEE NOTE 5

NOTES:

1. 3" PIPE SHALL BE GALVANIZED PIPE. RECTANGULAR TUBING SHALL BE STEEL.
2. MINIMUM WALL THICKNESS OF RECTANGULAR TUBING IS 3/16".
3. SLOPE SHALL MATCH CROSS GRADE OF SIDEWALK.
4. NO DRAIN SHALL BE PERMITTED IN DRIVE APPROACH AREAS.
5. DRAINS SHALL BE ANGLED THROUGH SIDEWALK IN DIRECTION OF GUTTER FLOW. SEE DETAIL 2.
6. PIPE OR TUBING SHALL BE CUT SQUARE AND ROUNDED WITH FACE OF CURB. SEE DETAIL 1.
7. PERMITTED SIZE AND NUMBER OF PIPES/TUBING TO BE BASED ON DRAINAGE AREA AND SHALL BE DETERMINED BY THE ENGINEER OF RECORD.
8. AREA 3" DIA. PIPE = 7.1 SQ. IN.
 AREA 3" X 5" RECT. TUBE = 12.3 SQ. IN. (3/16" THICK)
 AREA 3" X 6" RECT. TUBE = 14.9 SQ. IN. (3/16" THICK)
 AREA 3" X 12" CHANNEL = 36 SQ. IN.
 AREA 4" X 14" CHANNEL = 56 SQ. IN.
9. WHERE SIDEWALK AND CURB AND GUTTER EXIST, SIDEWALK AND CURB AND GUTTER SHALL BE REMOVED AND REPLACED TO THE NEAREST JOINT AND SHALL BE CONSTRUCTED PER APPLICABLE CITY OF VISALIA STANDARD DRAWINGS.
10. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AN ENCROACHMENT PERMIT FOR ANY WORK WITHIN THE CITY RIGHT OF WAY, INCLUDING THE REMOVAL AND REPLACEMENT OF THE SIDEWALK AND CURB AND GUTTER AND THE CONSTRUCTION OF THE RESIDENTIAL UNDER SIDEWALK DRAIN, FROM THE CITY OF VISALIA ENGINEERING DIVISION.
11. THE ENGINEER OF RECORD SHALL DETERMINE THE NUMBER OF DRAINS REQUIRED.
12. WELDED WIRE MESH SHALL BE 4X4-W2.1XW2.1.

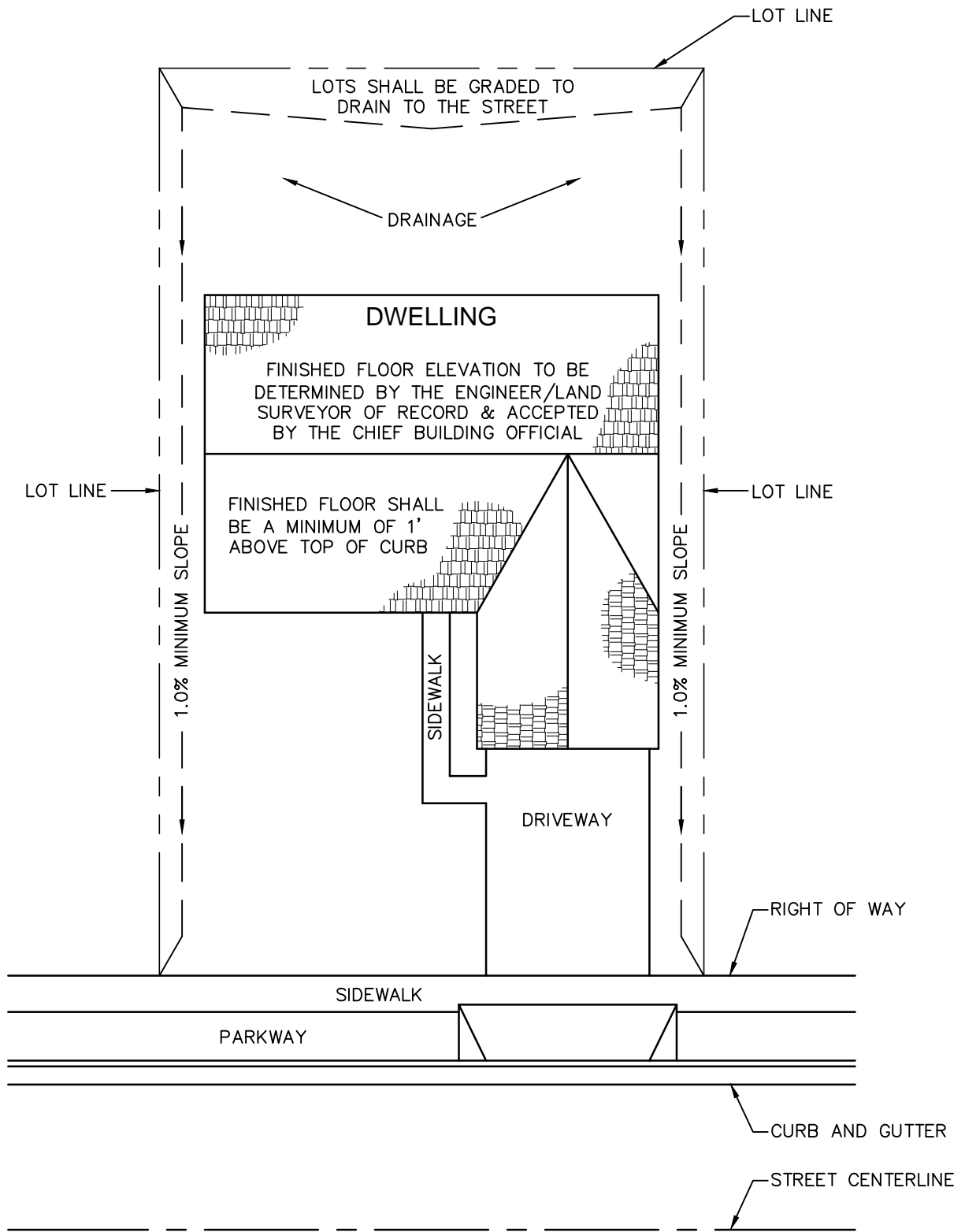
APPROVED BY: 
 CITY ENGINEER R.P.E. 81734
 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

COMMERCIAL SIDEWALK DRAIN

REVISIONS
 06/14/13
 BK 2016

D-20



APPROVED BY: *[Signature]* 09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

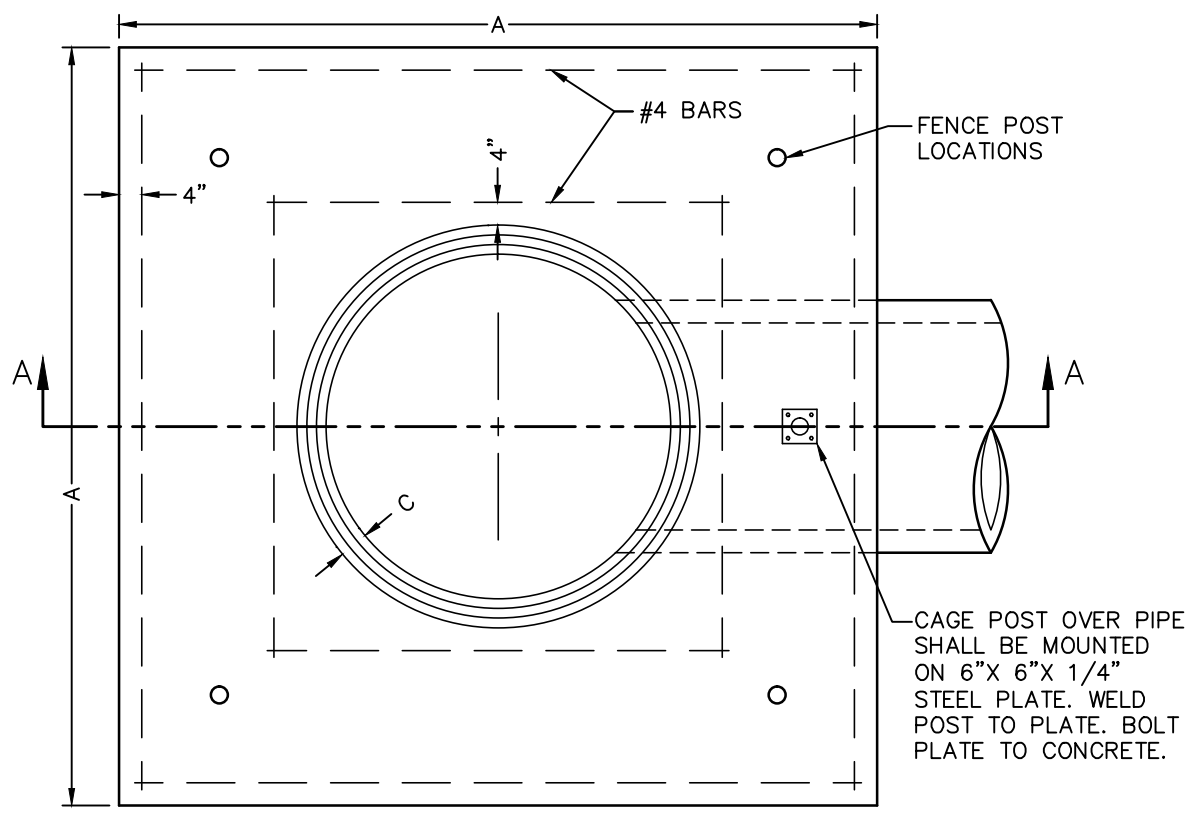
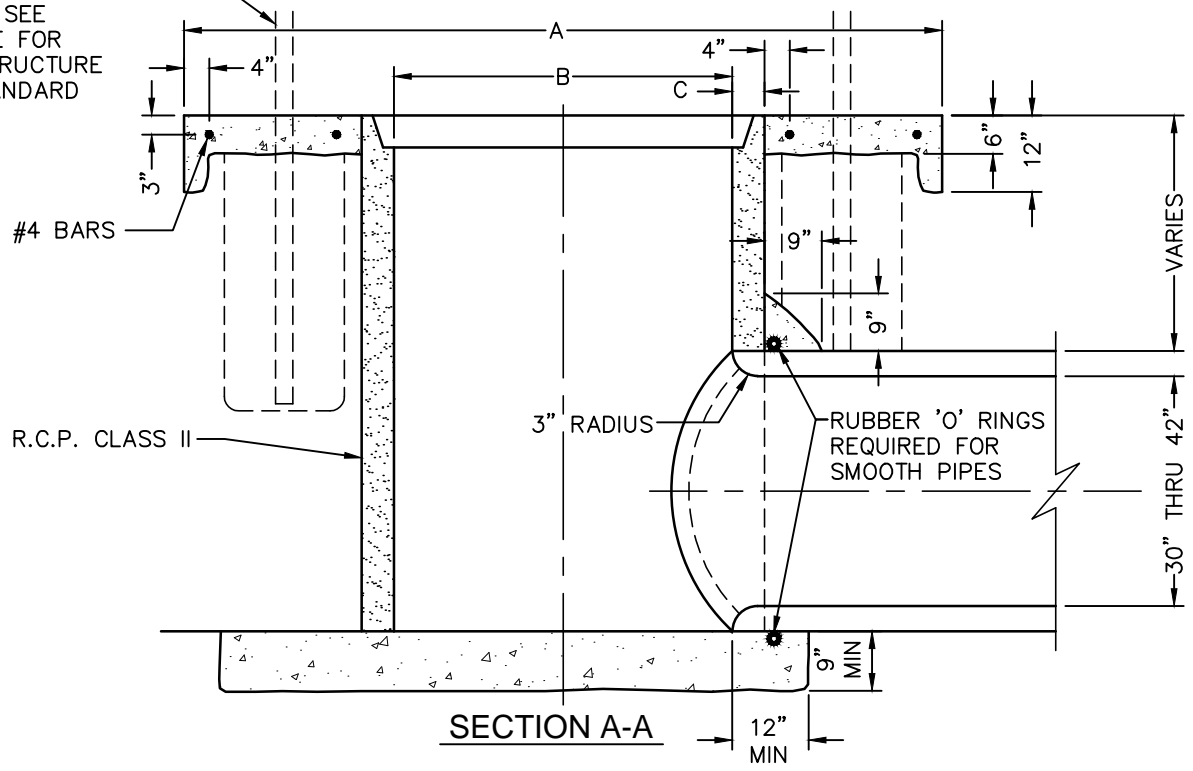
CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

TYPICAL LOT DRAINAGE

REVISIONS
 06/14/13
 BK 2016

D-21

FOR OUTFALL CAGE
STRUCTURE SEE
FENCE CAGE FOR
OUTFALL STRUCTURE
TYPE A STANDARD
DRAWING



NOTES:

1. FOR DIMENSIONS SEE DESIGN TABLE FOR OUTFALL STRUCTURE TYPE A STANDARD DRAWING.

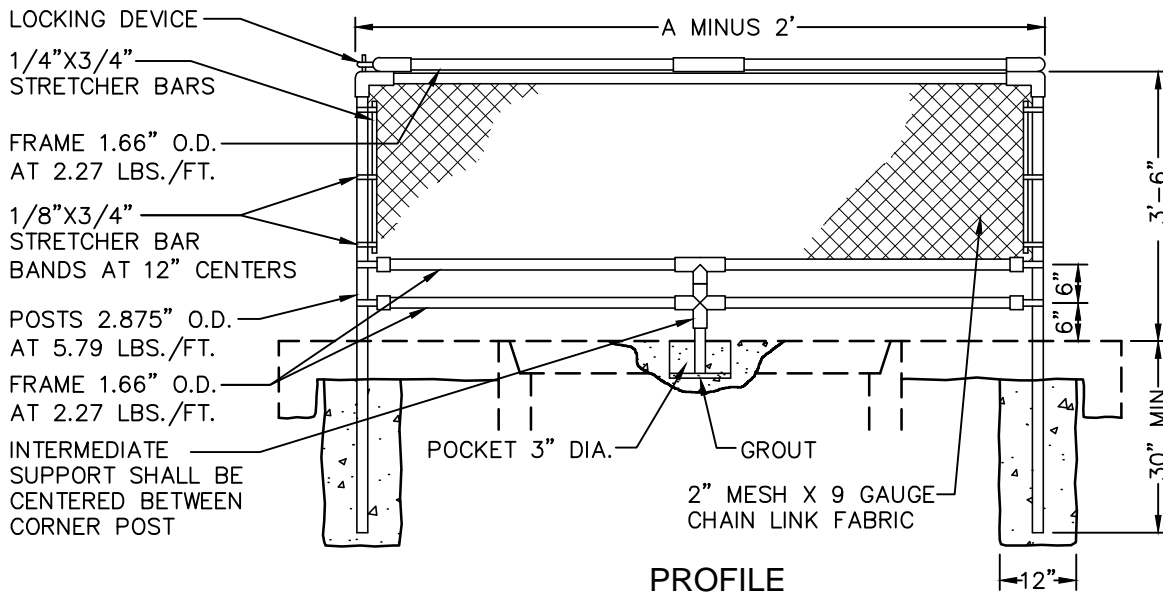
APPROVED BY: *[Signature]* 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

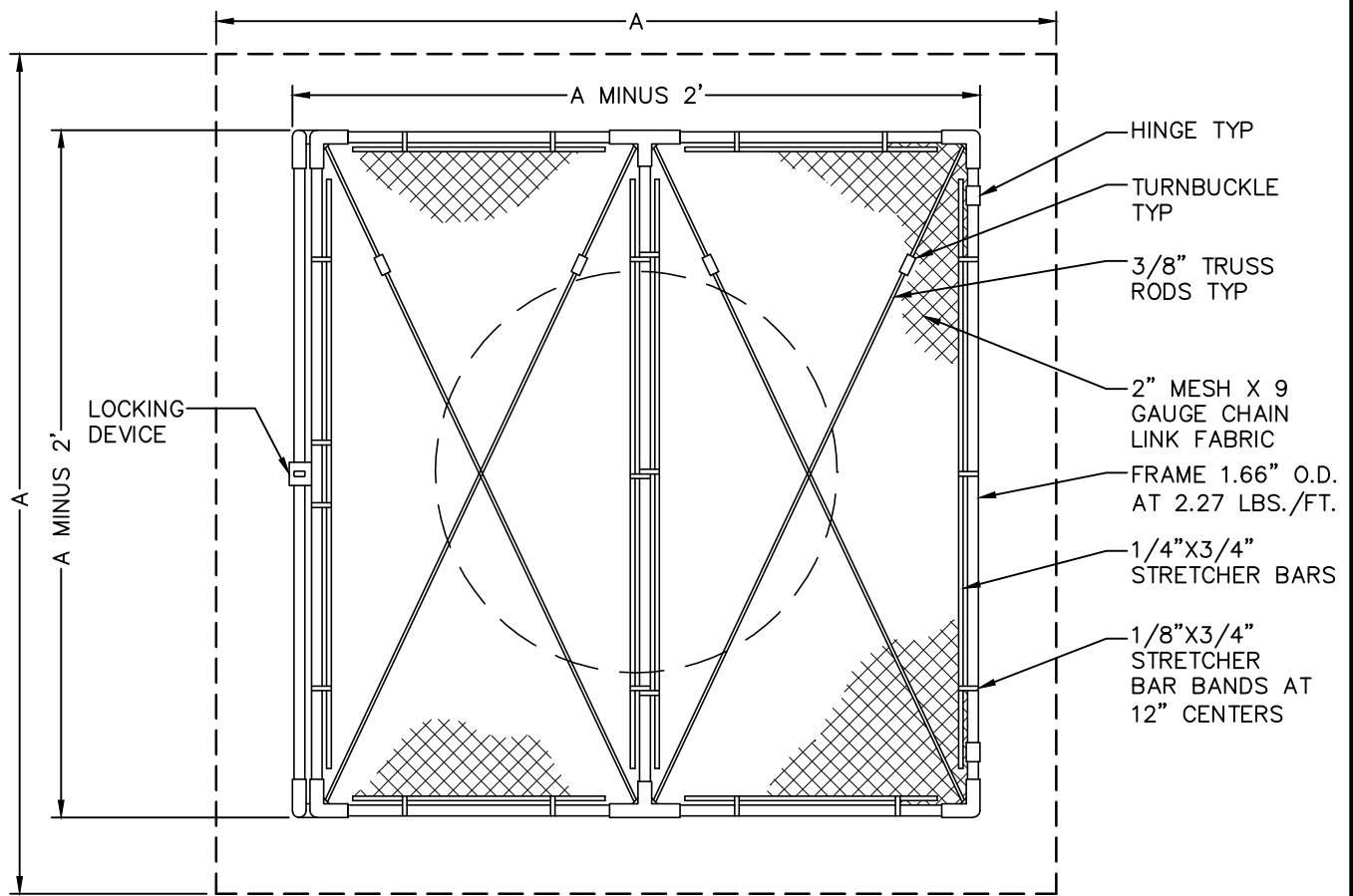
OUTFALL STRUCTURE
TYPE A

REVISIONS
11/15/07
BK 2016

D-22



PROFILE



PLAN

NOTES:

1. LOCKING DEVICE SHALL BE APPROVED BY THE CITY ENGINEER.
2. FOR DIMENSIONS SEE DESIGN TABLE FOR OUTFALL STRUCTURE TYPE A STANDARD DRAWING.

APPROVED BY:  09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

FENCE CAGE FOR OUTFALL STRUCTURE
 TYPE A

REVISIONS
 11/15/07
 BK 2016


D-23

TYPE	MAX PIPE SIZE	DESIGN (C.F.S.)	A	B	C
A	30"	12-16	8'-0"	42"	3 1/2"
A	36"	16-21	9'-0"	48"	4"
A	42"	21-29	10'-0"	54"	4 1/2"

DESIGN TABLE
TYPE A

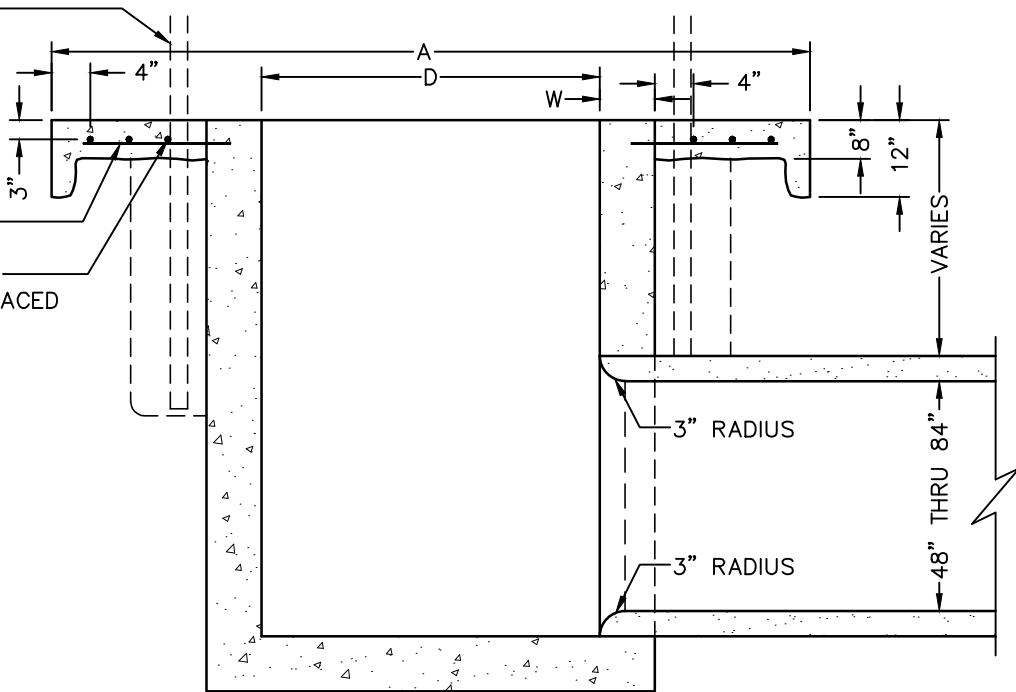
NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. REINFORCING BARS SHALL BE DEFORMED STEEL BARS AND SHALL BE GRADE 40 MINIMUM. REINFORCING BARS SHALL BE FREE OF RUST OR DIRT AND SHALL BE THOROUGHLY CLEANED BEFORE PLACEMENT.
3. REINFORCING BARS SHALL HAVE A MINIMUM OF 2" OF CLEAR COVERAGE.

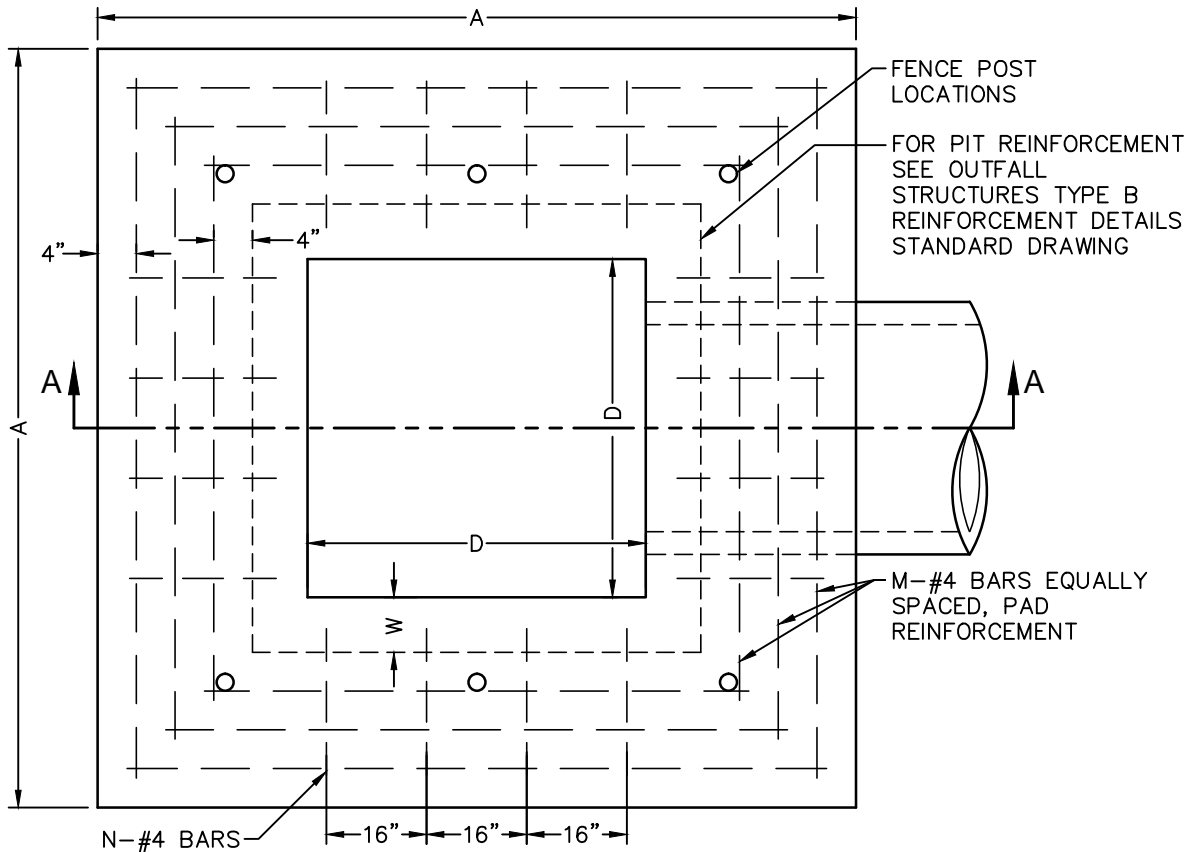
APPROVED BY:  <small>CITY ENGINEER R.P.E. 81734</small>	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
DESIGN TABLE FOR OUTFALL STRUCTURE TYPE A	REVISIONS 12/18/07 BK 2016
D-24	

FOR OUTFALL CAGE
STRUCTURE SEE
FENCE CAGE FOR
OUTFALL STRUCTURE
TYPE B STANDARD
DRAWING

N-#4 BARS
M-#4 BARS
EQUALLY SPACED



SECTION A-A



PLAN

NOTES:

1. FOR DIMENSIONS SEE DESIGN TABLE FOR OUTFALL STRUCTURE TYPE B STANDARD DRAWING.

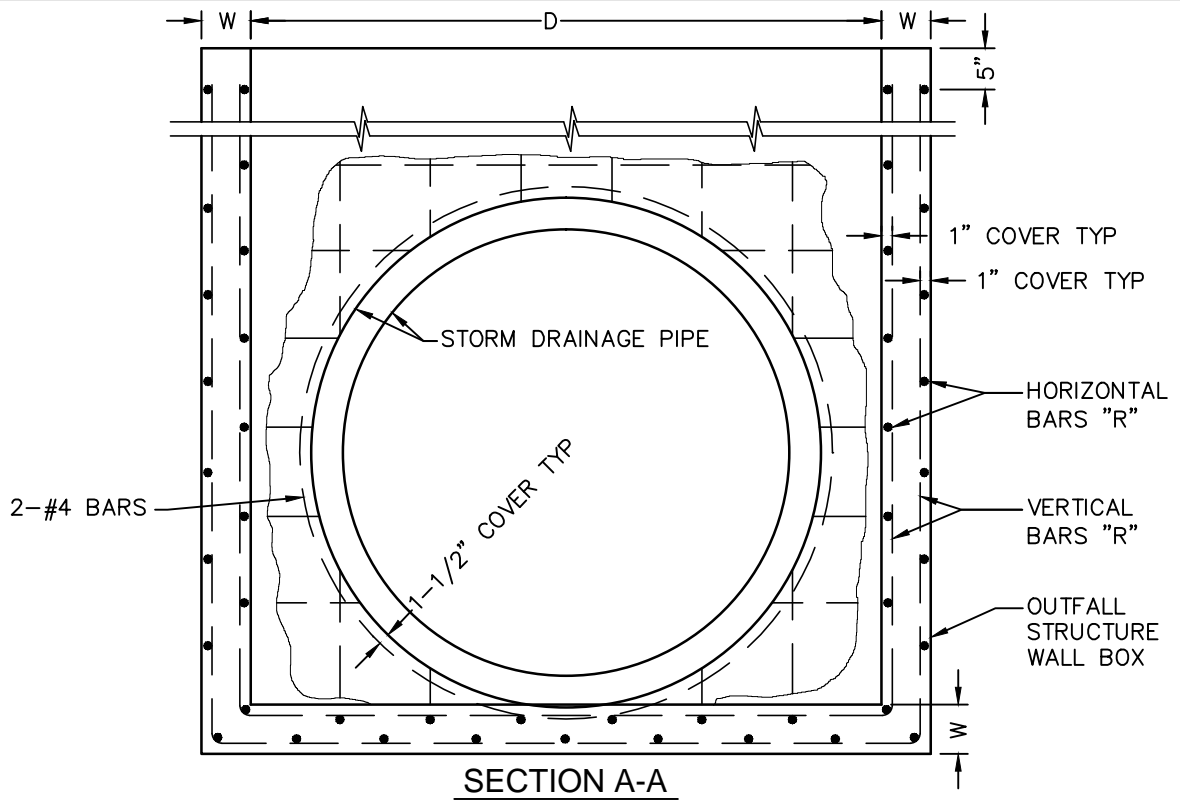
APPROVED BY: 
CITY ENGINEER R.P.E. 81734
09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

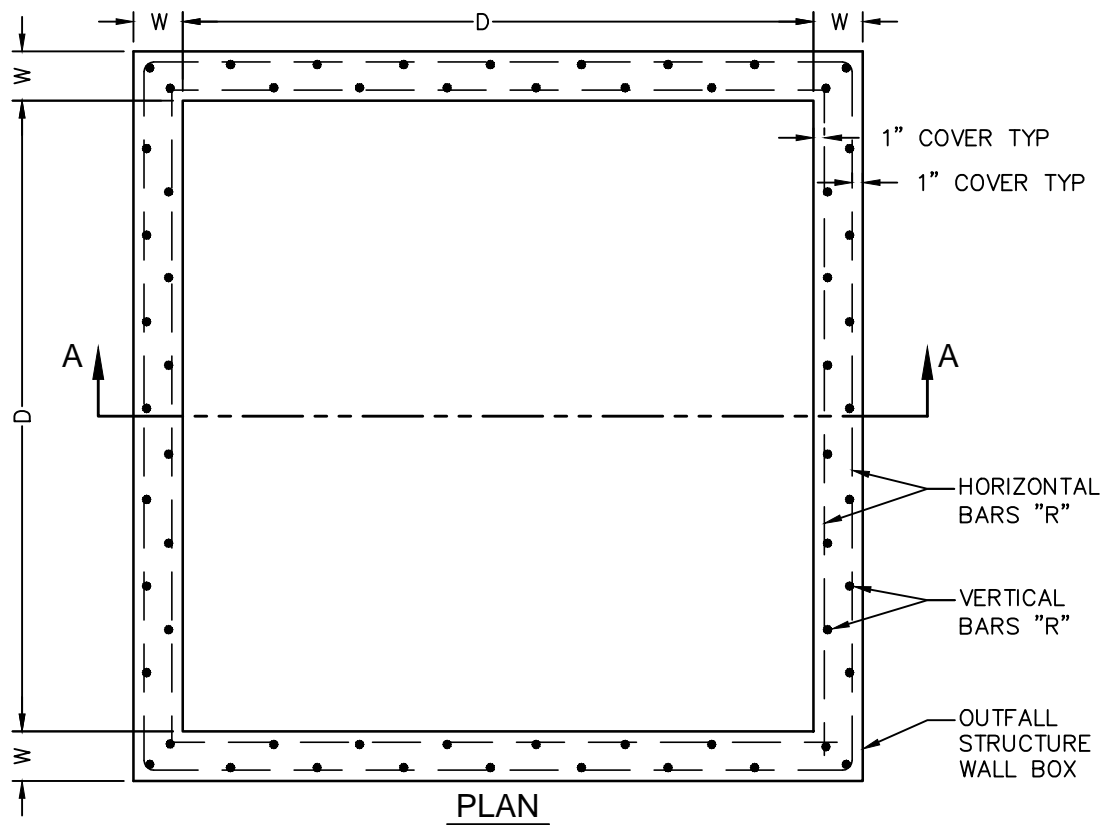
OUTFALL STRUCTURE
TYPE B

REVISIONS
11/13/07
BK 2016

D-25



SECTION A-A



PLAN

NOTES:

1. FOR DIMENSIONS AND REBAR SIZE AND SPACING SEE DESIGN TABLE FOR OUTFALL STRUCTURE TYPE B STANDARD DRAWING.
2. ALL REINFORCEMENT SHALL CONFORM WITH THE CITY OF VISALIA STANDARD SPECIFICATIONS.

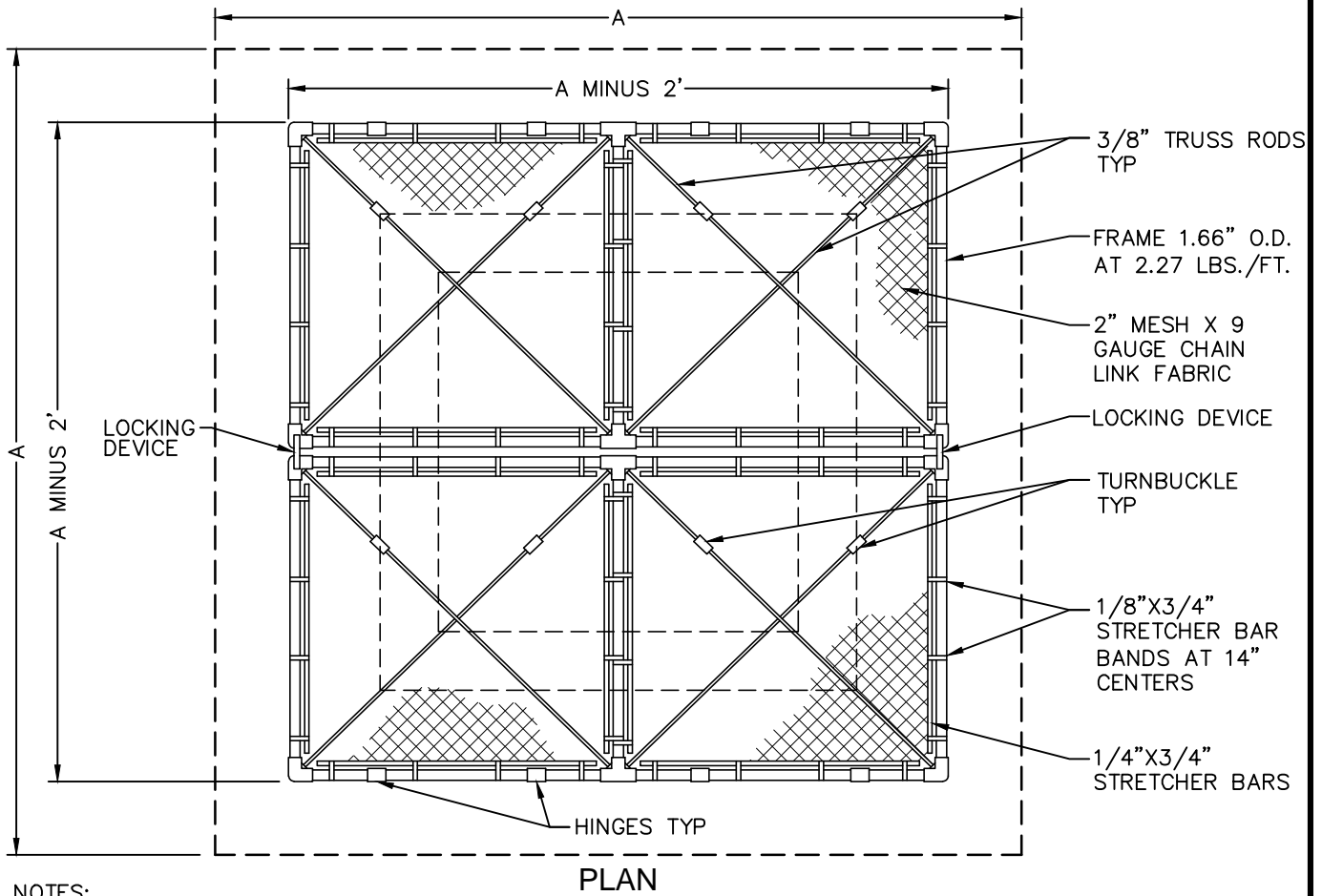
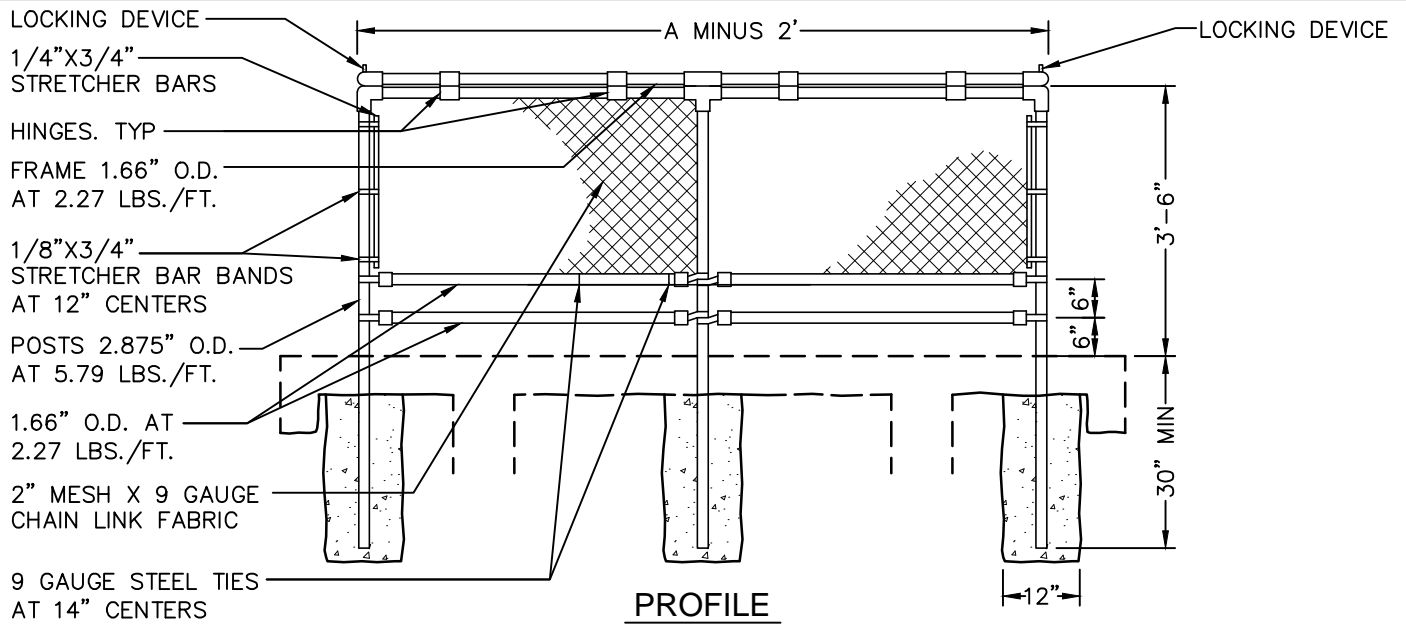
APPROVED BY: *[Signature]* 09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

**CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS**

**OUTFALL STRUCTURES TYPE B
 REINFORCEMENT DETAILS**

REVISIONS
 11/13/07
 BK 2016

D-26



NOTES:

1. LOCKING DEVICE SHALL BE APPROVED BY THE CITY ENGINEER.
2. FOR DIMENSIONS SEE DESIGN TABLE FOR OUTFALL STRUCTURE TYPE B STANDARD DRAWING.

APPROVED BY: 
 CITY ENGINEER R.P.E. 81734 09/16/16
 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

FENCE CAGE FOR OUTFALL STRUCTURE
 TYPE B

REVISIONS
 11/07/07
 BK 2016

D-27

TYPE	MAX PIPE SIZE	DESIGN (C.F.S.)	A	D	F	M	N	W	R*
B	48"	38-50	10'-0"	5'-0"	2'-6"	2	3	8"	#4 AT 12"
B	60"	50-65	12'-0"	6'-0"	3'-0"	3	4	8"	#4 AT 12"
B	66"	65-85	14'-0"	7'-0"	3'-6"	3	5	8"	#4 AT 12"
B	72"	85-110	16'-0"	8'-0"	4'-0"	3	6	10"	#5 AT 10"
B	84"	110-140	18'-0"	9'-0"	4'-6"	4	8	10"	#5 AT 10"

DESIGN TABLE
TYPE B

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
 2. REINFORCING BARS SHALL BE DEFORMED STEEL BARS AND SHALL BE GRADE 40 MINIMUM. REINFORCING BARS SHALL BE FREE OF RUST OR DIRT AND SHALL BE THOROUGHLY CLEANED BEFORE PLACEMENT.
 3. REINFORCING BARS SHALL HAVE A MINIMUM OF 2" OF CLEAR COVERAGE.
- * REINFORCEMENT SHALL CONSIST OF A DOUBLE CURTAIN BOTH DIRECTIONS OF THE SIZE AND SPACING NOTED. SEE OUTFALL STRUCTURE TYPE B REINFORCEMENT DETAILS STANDARD DRAWING

APPROVED BY:  CITY ENGINEER R.P.E. 81734	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
09/16/16 DATE	

DESIGN TABLE FOR
OUTFALL STRUCTURE TYPE B

REVISIONS
12/18/07
BK 2016

D-28

RESERVED FOR FUTURE DETAIL

APPROVED BY: _____

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

RESERVED

REVISIONS

BK 2016

D-29

RESERVED FOR FUTURE DETAIL

APPROVED BY: _____

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

RESERVED

REVISIONS

BK 2016

D-30

RESERVED FOR FUTURE DETAIL

APPROVED BY: _____

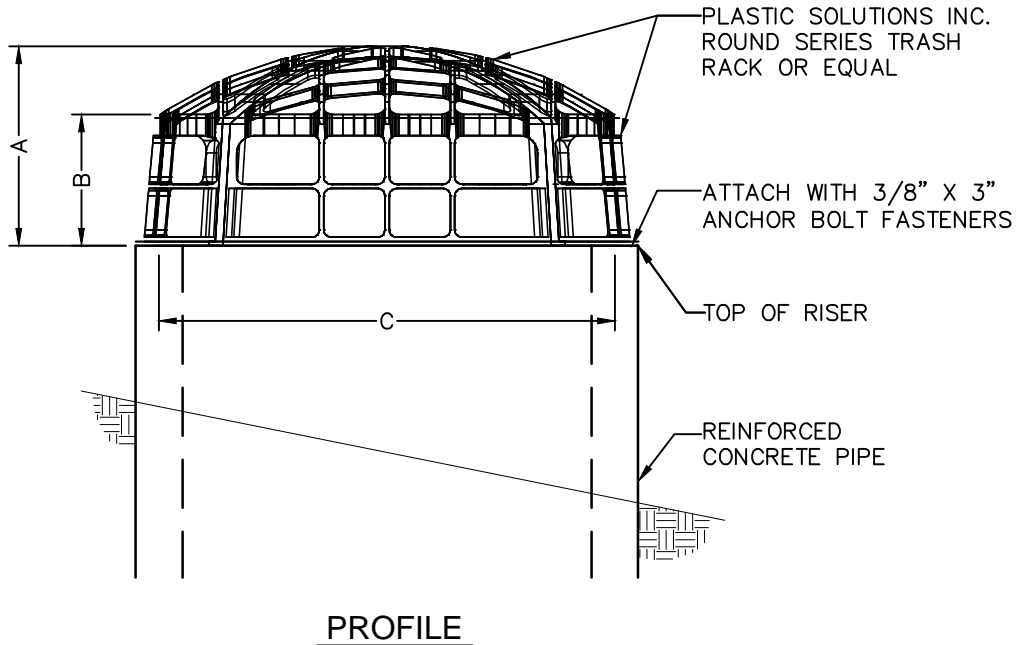
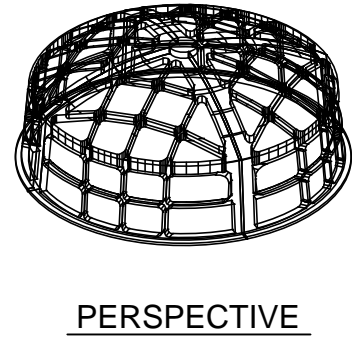
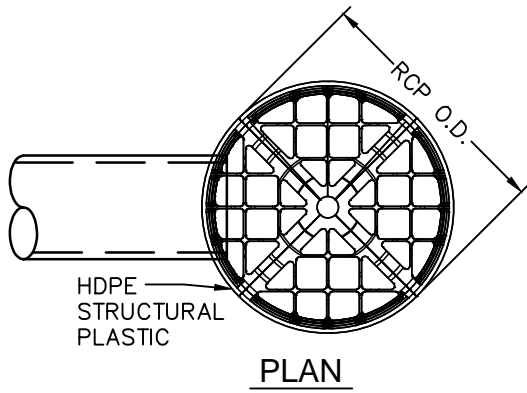
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

RESERVED

REVISIONS

BK 2016


D-31



ROUND SERIES TRASH RACKS FOR CONCRETE RISERS BY PLASTIC SOLUTIONS, INC. (DIMENSIONS IN INCHES)					
PART NO.	DIM. A	DIM. B	DIM. C	MIN. ID.	MIN. OD.
RS-24	17-1/4	14-1/4	28	24	30
RS-36	21-1/4	14-3/8	40-7/8	36	43
RS-48	27-3/4	18	54	48	57
RS-60	27-1/2	18-1/4	66-1/2	60	70

NOTES:

1. INLET STRUCTURE SHALL BE SIZED BY THE ENGINEER OF RECORD AND APPROVED BY THE CITY ENGINEER.

APPROVED BY:  09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

ROUND TRASH RACK FOR
 BASIN PUMP INLET STRUCTURE

REVISIONS
 06/14/13
 BK 2016

D-32

RESERVED FOR FUTURE DETAIL

APPROVED BY: _____

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

RESERVED

REVISIONS

BK 2016

D-33

RESERVED FOR FUTURE DETAIL

APPROVED BY: _____

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

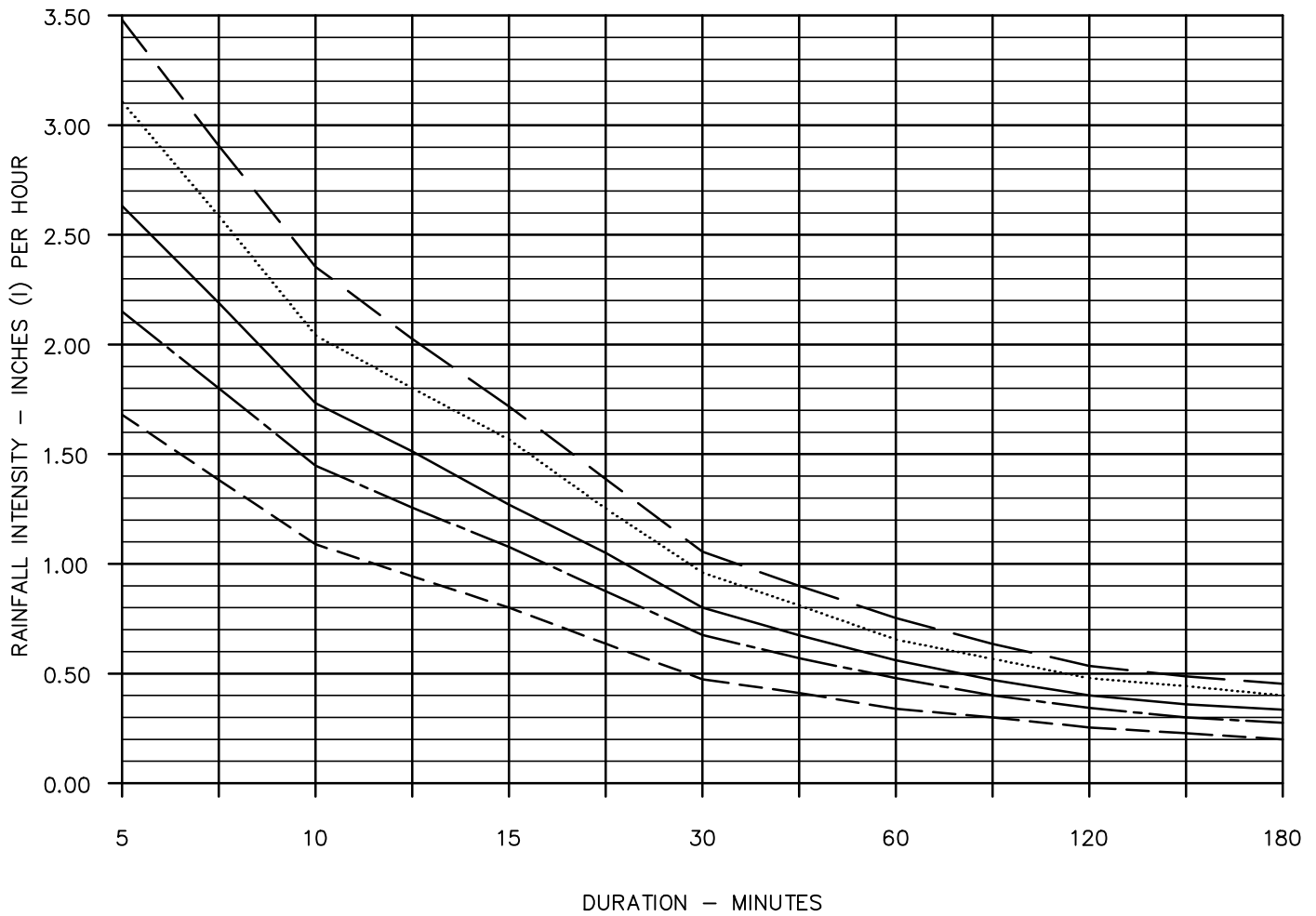
RESERVED

REVISIONS

BK 2016

D-34

2 YEAR - - - - -
 5 YEAR - - - - -
 10 YEAR - - - - -
 25 YEAR
 50 YEAR - - - - -



APPROVED BY: *[Signature]* 09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

INTENSITY DURATION CURVES

REVISIONS
 06/18/04
 BK 2016

D-35

STORM DRAINAGE DESIGN CRITERIA

LEVEL OF PROTECTION

ITEM	VOLUME	LEVEL OF PROTECTION
MINOR (COLLECTOR) DRAINS	N/A	2 YEAR
MAJOR DRAINS	N/A	10 YEAR
IN-TOWN DETENTION BASINS	10 YEAR - 1 DAY	10 YEAR - 10 DAY
IN-TOWN RETENTION BASINS	10 YEAR - 10 DAY	10 YEAR - 10 DAY
INDUSTRIAL PARK RETENTION BASINS	10 YEAR - 10 DAY	10 YEAR - 10 DAY
DOWNSTREAM ULTIMATE STORAGE BASINS	10 DAY - 50 YEAR	10 DAY - 50 YEAR

NOTES:

1. MAJOR DRAINS GENERALLY SERVE AREAS IN EXCESS OF 100 ACRES. THESE DRAINS ARE DEFINED AND ANALYZED IN THE CITY'S STORM WATER MASTER PLAN.
2. MINOR DRAINS CONVEY RUNOFF TO THE MAJOR DRAINS AND GENERALLY SERVE AREAS LESS THAN 100 ACRES.
3. THE STORAGE VOLUME FOR DETENTION STORAGE IS BASED ON A 10-YEAR, 1-DAY STORM EVENT WITH A TOTAL RAINFALL OF 2.09 INCHES. THE BASIN SHALL ALSO ACCOMMODATE A 10-YEAR, 2-DAY EVENT WITH A TOTAL RAINFALL OF 2.64 INCHES WITH FREEBOARD AND PUMPING TAKEN INTO ACCOUNT. THE MAXIMUM DESIGN DEPTH AND SIDE SLOPES OF THE BASIN MUST BE APPROVED BY THE CITY. DISCHARGE PUMPS WITH A CITY APPROVED CAPACITY SHALL BE INSTALLED AND OPERATED IN ACCORDANCE WITH CITY STORM WATER DISCHARGE POLICIES.
4. THE STORAGE VOLUME FOR RETENTION STORAGE IS BASED ON A 10-YEAR, 10-DAY STORM EVENT WITH A TOTAL RAIN FALL OF 4.17 INCHES. DISCHARGE PUMPS CAN ONLY BE INSTALLED AND OPERATED WITH THE APPROVAL OF THE CITY.
5. THE DESIGN WATER SURFACE ELEVATION IN A BASIN SHALL BE A MINIMUM OF ONE FOOT BELOW THE LOWEST CATCH BASIN IN THE AREA THAT IS TRIBUTARY TO THE BASIN.
6. THE CITY DOES NOT CONSIDER PERCOLATION/INFILTRATION FACTORS IN SIZING BASINS.

RATIONAL METHOD RUNOFF COEFFICIENTS AND DESIGN CRITERIA FOR STORM WATER BASINS

LAND USE	COEFFICIENT OF RUNOFF (C)	STORAGE VOLUME (ACRE-FEET/ACRE)	
		<u>DETENTION</u>	<u>RETENTION</u>
INDUSTRIAL AND COMMERCIAL	0.85	0.148	0.295
PROFESSIONAL OFFICE	0.65	0.113	0.226
RESIDENTIAL			
- HIGH DENSITY (15-29 UNITS/ACRE)	0.55	0.096	0.191
- MEDIUM DENSITY (11-14 UNITS/ACRE)	0.45	0.078	0.156
- LOW DENSITY (3-10 UNITS/ACRE)	0.35	0.061	0.122
- RURAL (1-2 UNITS/ACRE)	0.30	0.052	0.104
PUBLIC/INSTITUTIONAL	0.40	0.070	0.139
OPEN SPACE			
- IMPROVED (PARKS)	0.25	0.044	0.087
- UNIMPROVED	0.15	0.026	0.052

DESIGN CRITERIA

1. THE RATIONAL METHOD MAY BE USED TO DETERMINE PEAK FLOWS AND RUNOFF VOLUMES FOR AREAS LESS THAN 150 ACRES.
2. ALL NEW DEVELOPMENTS SHALL BE DESIGNED SUCH THAT THE SURFACE OF PONDED WATER DURING THE 100-YEAR RAINFALL EVENT DOES NOT RISE MORE THAN ONE FOOT ABOVE THE LOWEST TOP OF CURB IN THE DEVELOPMENT.
3. LOT TO STREET TIME = 25 MINUTES. (RESIDENTIAL ONLY)
4. GUTTER VELOCITY = 2 FEET PER SECOND.

APPROVED BY:  CITY ENGINEER R.P.E. 81734	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS 09/16/16 DATE
---	--

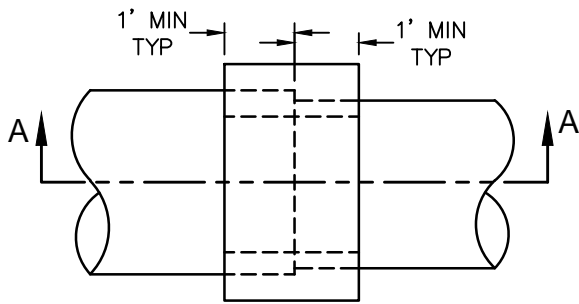
DESIGN CRITERIA FOR DRAINAGE

REVISIONS

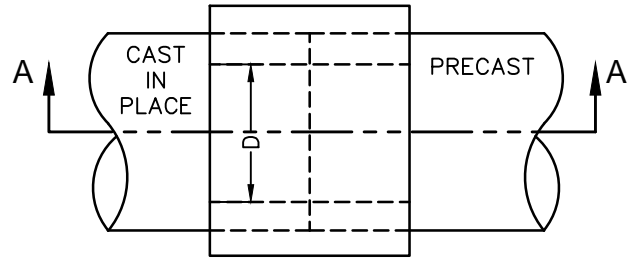
06/14/13

BK 2016

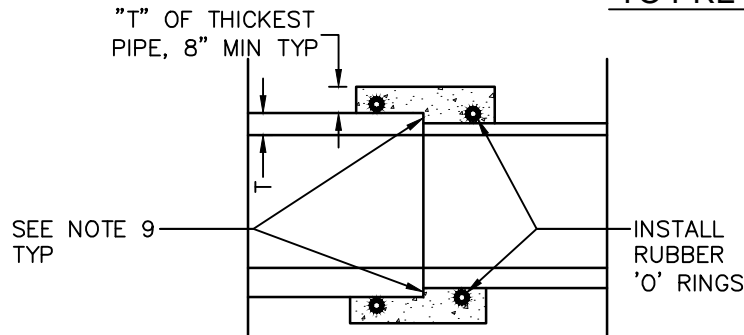
D-36



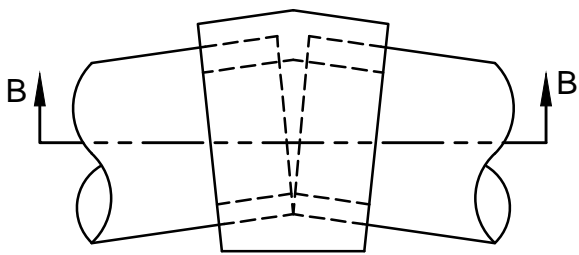
JOINING DISSIMILAR PIPES



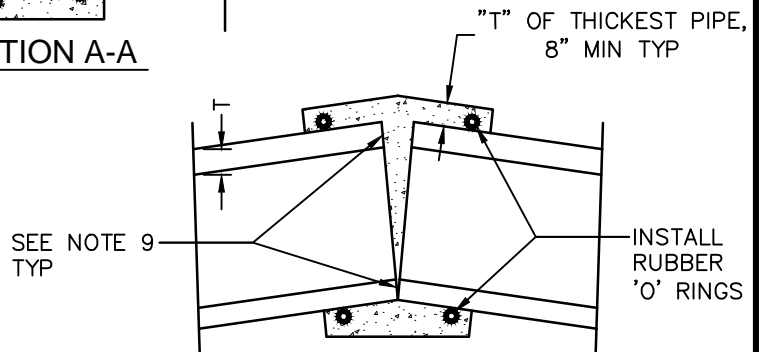
JOINING CAST-IN-PLACE
TO PRE-CAST PIPES



SECTION A-A



ANGLE EXCEEDING NORMAL
DEFLECTION ANGLE*



SECTION B-B

NOTES:

1. CONCRETE COLLAR SHALL BE CLASS 2 CONCRETE.
2. INSIDE COLLAR SHALL MATCH PIPE DIAMETER, SMOOTH STEEL TROWEL FINISH.
3. ALLOW CONCRETE TO HARDEN BEFORE BACKFILLING.
4. WHEN FORMING ANGLES ENGINEER MAY REQUIRE CHAMFERING OF PIPE ENDS.
5. JOINTS SHALL BE WATER TIGHT.
6. THIS DETAIL IS NOT FOR USE WITH PVC/PLASTIC PIPES. JOINING OF PVC/PLASTIC PIPES SHALL BE AS APPROVED BY THE CITY ENGINEER.
7. THIS DETAIL MAY BE USED FOR PIPES UP TO 48" IN DIAMETER. COLLARS FOR PIPES LARGER THAN 48" SHALL BE AS APPROVED BY THE CITY ENGINEER.
8. EXFILTRATION TEST REQUIRED AS PER ASTM C969-02 AS IMPLEMENTED BY THE CITY OF VISALIA.
9. CONTRACTOR SHALL INSTALL A QUICK SETTING TYPE HYDRAULIC CEMENT TO ALL JOINTS PRIOR TO POURING CONCRETE COLLAR. HYDRAULIC CEMENT SHALL BE A NON-SHRINKING, NON-METALLIC AND NON-CORROSIVE TYPE WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5,000 P.S.I. HYDRAULIC CEMENT DATA SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. JOINT SEAL SHALL BE WATER TIGHT.

* THIS INSTALLATION METHOD SHALL ONLY BE USED WHERE APPROVED BY THE CITY ENGINEER IN WRITING. SEE NOTE 4.

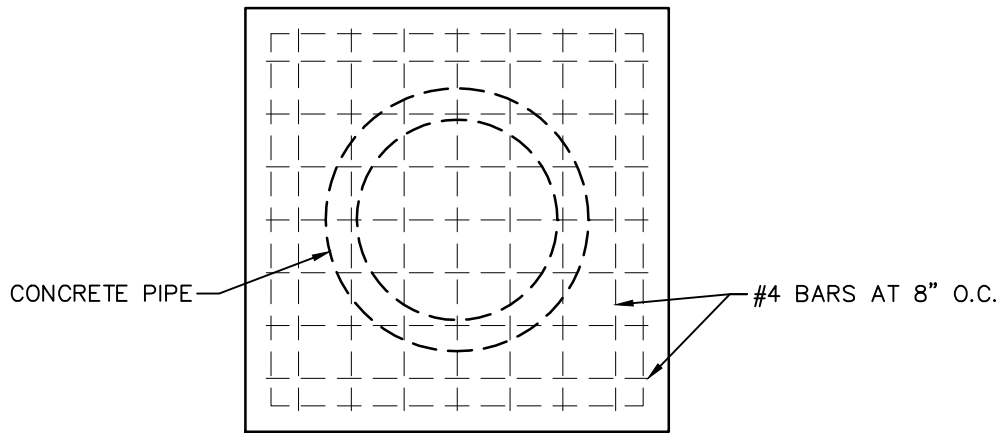
APPROVED BY:  09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

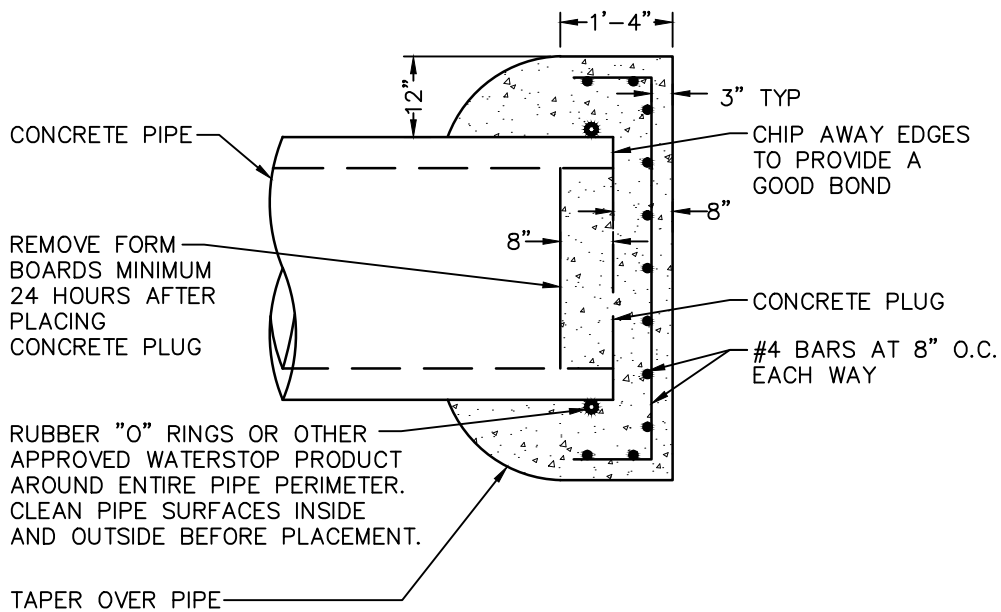
CONSTRUCTION JOINT
CONCRETE FILLED COLLAR

REVISIONS
06/14/13
BK 2016

D-37



FRONT VIEW



SECTION

NOTES:

1. END PLUG SHALL ONLY BE USED WHERE APPROVED BY THE CITY ENGINEER.
2. THIS PLUG SHALL BE USED ON PIPES WITH AN INNER DIAMETER OF 12" UP TO 48". END PLUGS FOR PIPES WITH AN INNER DIAMETER LARGER THAN 48" SHALL BE DESIGNED BY THE ENGINEER OF RECORD AND APPROVED BY THE CITY ENGINEER.
3. REBAR AND CONCRETE SHALL COMPLY WITH THE CITY OF VISALIA STANDARD SPECIFICATIONS.
4. CONCRETE SHALL BE CLASS 2.
5. PIPE END PLUG SHALL BE WATER TIGHT.
6. EXFILTRATION TEST REQUIRED AS PER ASTM C969-02 AS IMPLEMENTED BY THE CITY OF VISALIA.

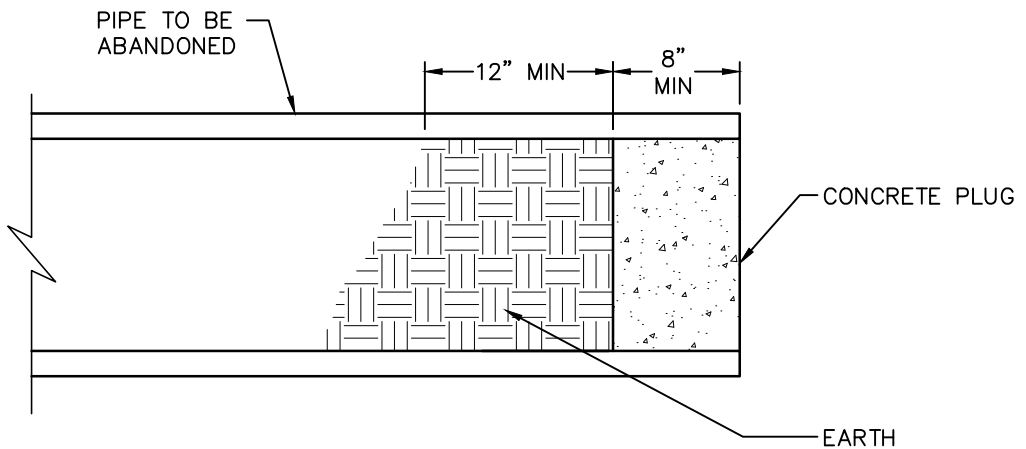
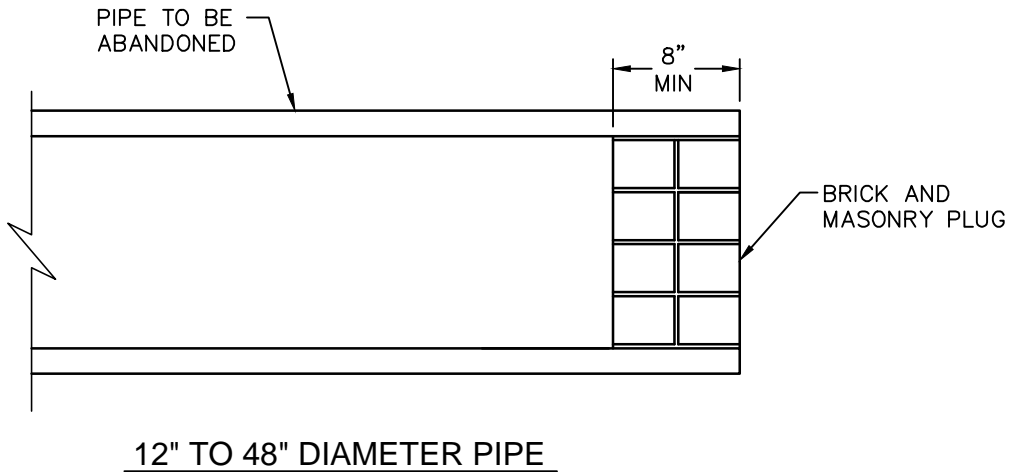
APPROVED BY:  09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

PIPE END PLUG FOR CONCRETE PIPE


REVISIONS
 06/14/13
 BK 2016

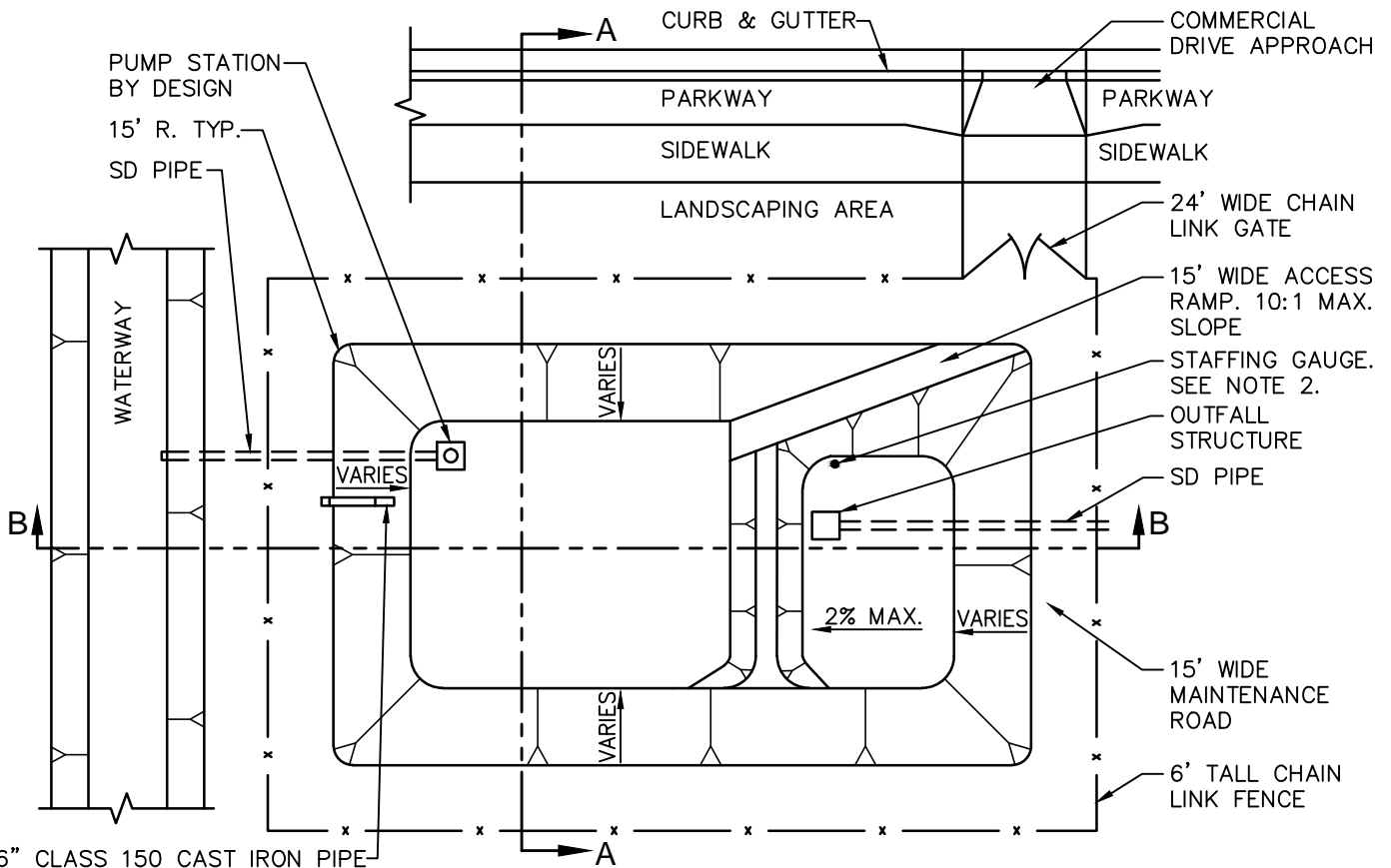
D-38



NOTES:

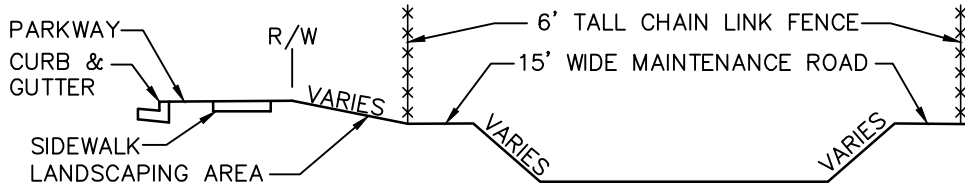
1. PIPE PLUGS SHALL BE INSTALLED TO THE SATISFACTION OF THE ENGINEER.
2. WHERE REQUIRED BY THE CITY ENGINEER, ABANDONED PIPES 12" AND LARGER, SHALL BE FILLED COMPLETELY WITH CEMENT SLURRY BACKFILL.
3. ALL PLUGS SHALL COMPLY WITH THE CITY OF VISALIA STANDARD SPECIFICATIONS.
4. PIPE END PLUG SHALL BE WATER TIGHT.
5. VIDEO INSPECTION REQUIRED PRIOR TO ABANDONMENT OF PIPE.

APPROVED BY:  CITY ENGINEER R.P.E. 81734	09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
ABANDONED SANITARY SEWER AND STORM DRAIN PIPE PLUG	REVISIONS 06/14/13 BK 2016	D-39

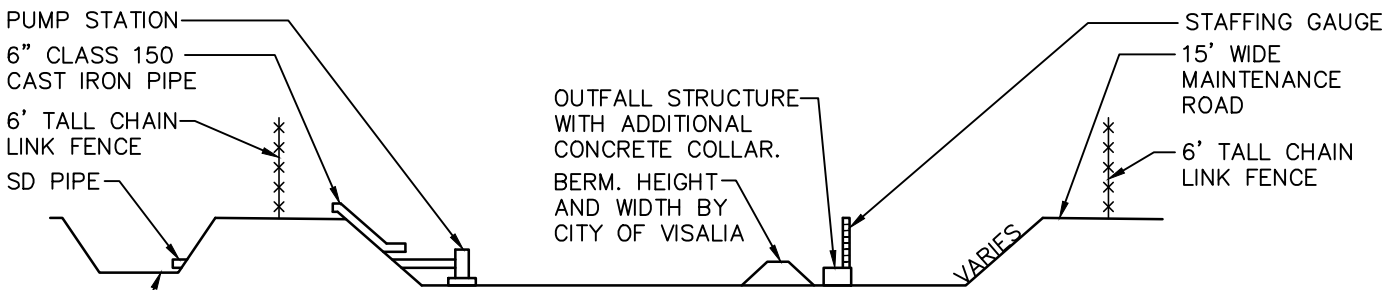


6" CLASS 150 CAST IRON PIPE TO BE INSTALLED AS REQUIRED BY CITY ENGINEER. SEE PONDING BASIN 2 OF 2 STANDARD DRAWING.

PLAN



SECTION A-A



SECTION B-B

NOTES:

1. REQUIREMENTS PER BASIN TO BE APPROVED BY CITY ENGINEER.
2. STAFFING GAUGE TO BE 4" GALVANIZED POLE. WHITE REFLECTIVE TAPE TO BE PLACED EVERY FOOT STARTING AT THE TOP OF BANK TO THE BOTTOM OF THE BANK. RED REFLECTIVE TAPE SHALL BE PLACED AT THE HIGH WATER LINE. EMBEDDING DEPTH AND FOOTING TO BE DETERMINED WITH PLANS.

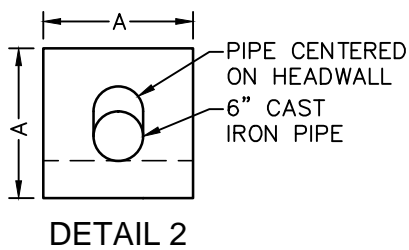
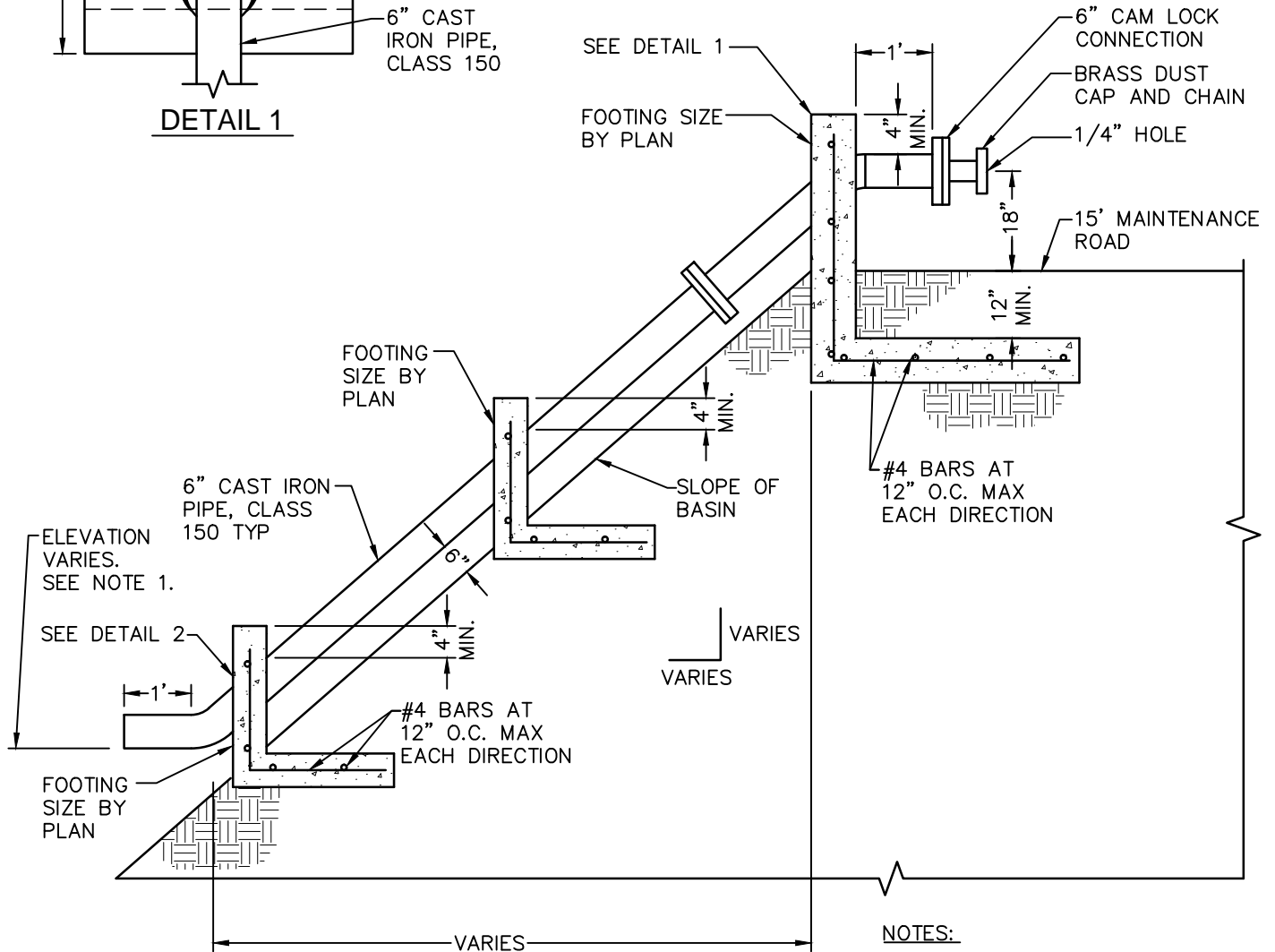
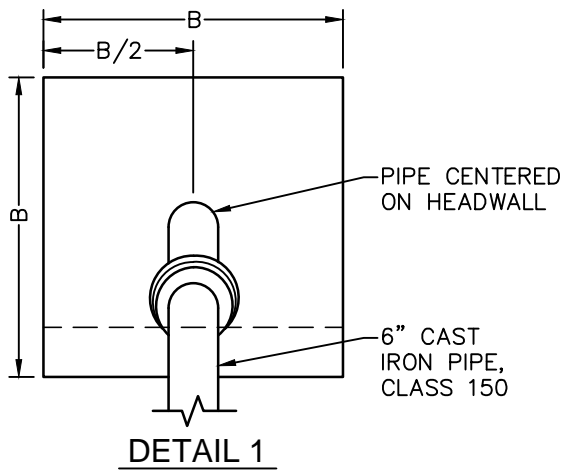
APPROVED BY: *[Signature]* 09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

PONDING BASIN 1 OF 2

REVISIONS
09/15/16
BK 2016

D-40



NOTES:

1. SET INLET PIPE ELEVATION BELOW MIDPOINT OF BASIN HIGHWATER LINE AND BOTTOM OF BASIN.
2. ALL CONCRETE SHALL BE CLASS 2.

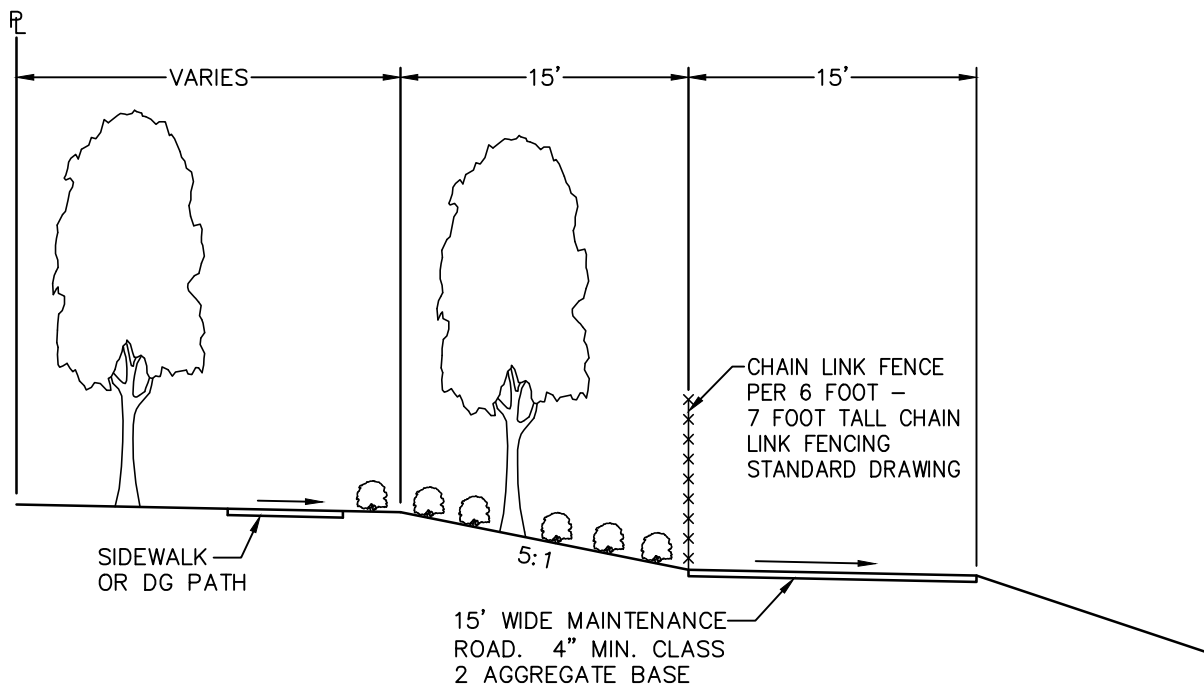
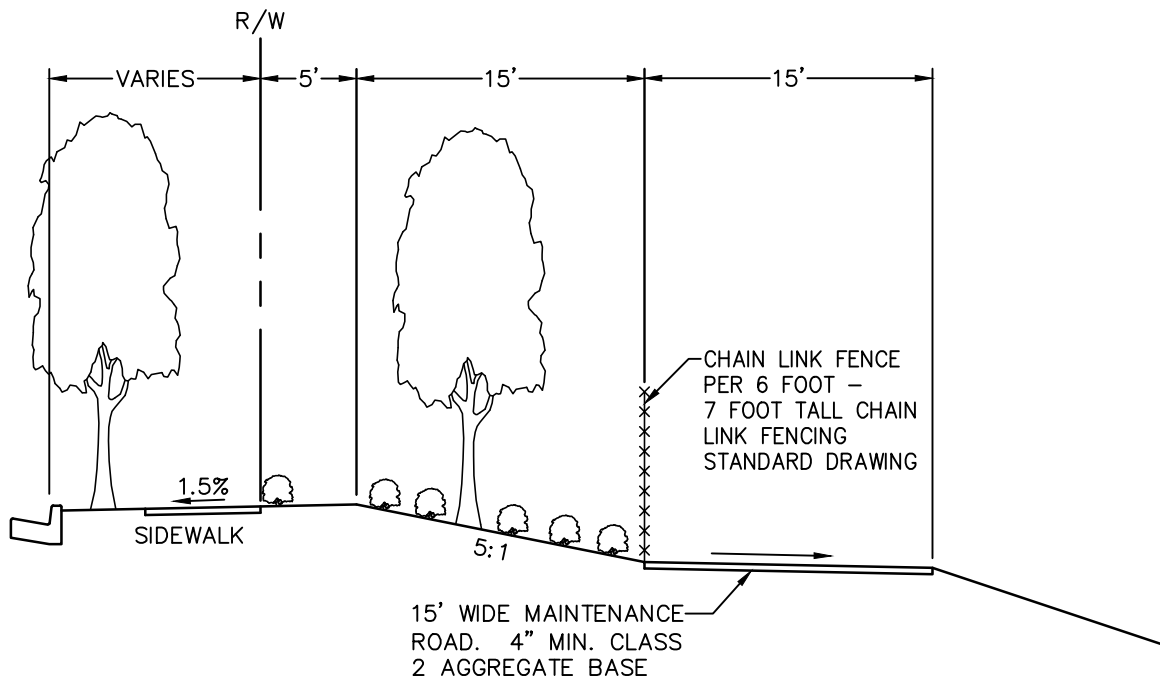
APPROVED BY: *[Signature]* 09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

PONDING BASIN 2 OF 2

REVISIONS
 09/15/16
 BK 2016

D-41



NOTES:

1. REFER TO CONCRETE IMPROVEMENT STANDARD DRAWINGS FOR SIDEWALK AND PARKWAY REQUIREMENTS.
2. DESIGN SHALL MINIMIZE EROSION.
3. SIDE SLOPE STABILIZATION AND HYDROSEEDING REQUIREMENTS PER CITY STANDARD SPECIFICATIONS OR AS DIRECTED BY THE CITY ENGINEER.

APPROVED BY:  09/16/16
 CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
 DESIGN & IMPROVEMENT STANDARDS

**BASIN PERIMETER
 LANDSCAPING SECTION**

REVISIONS
 09/01/16
 BK 2016

D-42